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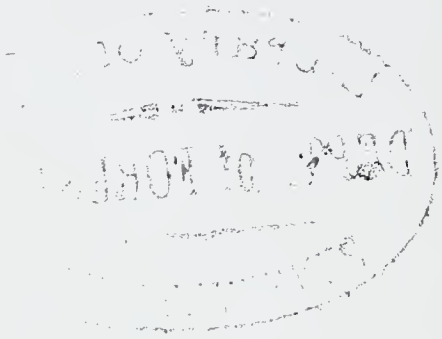

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TREES AND SHRUBS

Food, Medicinal, and Poisonous Plants

of

British Columbia

by

JAMES R. ANDERSON

Veteran Naturalist of Victoria, B.C.

PUBLISHED BY THE
DEPARTMENT OF EDUCATION

VICTORIA, B.C.:
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1925.

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TO THE MEMORY OF MY FRIEND
AND COADJUTOR,
THE LATE JAMES FLETCHER,
THIS WORK IS GRATEFULLY DEDICATED.

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FOREWORD.

THIS manual has been prepared as a reference book for use in the schools of the Province and remains the property of the school to which it is sent. It is hoped that the book, which gives authentic information relative to the native trees and shrubs of the Province, and also includes many interesting data with reference to poisonous plants and wild plants formerly used for food purposes by the natives, will prove of material assistance to the teachers in stimulating a wider and more intelligent interest in our nature flora. In the preparation and publication of the manual the Department of Education has received valuable assistance from the Forest Branch of the Department of Lands. In furnishing the concluding chapter on our forests and their protection, and in supplying photographs for purposes of illustration, the Chief Forester and his assistants have contributed a great deal to the practical value of the manual. The co-operation of the Lands Department in helping to meet the cost of publishing the manual is also deeply appreciated.

The subject-matter of the manual was prepared by Mr. James R. Anderson, one of the leaders among the pioneer botanists of British Columbia, a man for whom the love of trees and flowers has been a lifelong, ruling passion. For years Mr. Anderson enjoyed the intimate friendship of such great Canadian botanists as the late Dr. James Fletcher, then Dominion Botanist and Entomologist, to whose memory he has so fittingly dedicated this little work; the late Professor John Macoun, who spent the later years of his life in this Province and who knew the Dominion of Canada and its varied flora and forest lands as few men have known it; and the late Dr. Charles Newcombe, one of the best-known authorities on the flora of British Columbia.

It is to be hoped that the mantle of such great naturalists as these may fall upon others of our native sons and daughters, and that many boys and girls who now frequent our schools and halls of learning may come to know and to appreciate the more our great heritage of natural wealth and beauty for having read this book.

For much painstaking work in carefully examining sources and nomenclature and in reading the proof-sheets the thanks of the Department is due to the Rev. Robert Connell, of Victoria. Grateful acknowledgment of the courtesy extended by several of the leading photographers of the Province in permitting the use of excellent photographs for purposes of illustration is hereby made. The origin of each photograph so furnished is indicated throughout the book.

PREFACE.

IN the following pages I have attempted to describe for popular use the native forest trees, shrubs, and food, medicinal, and poisonous plants of the Province, and to tell how to distinguish them, to the best of my ability, in language understandable by "the man in the street," avoiding as far as possible all technical terms. Hence it is to be expected that adverse criticism will not be absent, and I shall therefore take this opportunity of asking critics for lenient judgment, taking into consideration the fact that most people are unfamiliar with scientific terms, and therefore the selection or employment of others of a vernacular character conveying the same meaning is not always an easy matter and possibly sometimes inappropriate. The scientific or botanical names given are those by which the plants are generally known in Canada, avoiding all conflict with other authorities. And here let me say to such of my readers as have not considered the question that the scientific names of plants are after all the only accurate names, those by which they are known all over the world; hence their use. Common names, on the other hand, are in most cases only local, and are often misleading, from the fact that the same name is frequently used for several different plants. For instance, the term "Bull-pine" is used for *Pinus ponderosa* and *Pinus contorta;* "Cottonwood" for *Populus trichocarpa* and *Populus tremuloides* and for some of the Willows; "Bearberry" for several plants and often confounded with Barberry, and so on. In all cases I have given the popular name when known, supplying others according to some known peculiarity and leaving a few without any common name. The explanation or translation of the specific botanical names is given in order that the reason for their selection may be understood. I may, however, here take the opportunity of expressing my dissent from a few of them on account of their being inappropriate, but in most cases they have been given with good reason. The generic names I have not considered necessary to explain, as many of them are merely the Latin names of the plants. In some other cases they are "made-up" names in honour of some person. The botanical names are explained in an addendum, as are the few scientific terms which I have used.

I may add that the plants I have endeavoured to describe are only those which have come under my personal observation during the many years that I have been interested in the subject of plant-life. It must, therefore, naturally be expected that it is not a full and complete list of all the shrubs, and this remark is particularly applicable to the Willows, a class which has not been fully worked out. Of the trees proper, however, I believe about all have been enumerated, and I would warn my readers against accepting the conclusions of some writers and others who have multiplied names erroneously and in some instances have given names of trees and shrubs as occurring in the Province without good and substantial grounds. In making these remarks, however, I do not wish it to be understood that I question the conclusions of such high authorities as Macoun, Sargent, Sudworth, Piper, and others, in case anything I have written is not in accordance with their investigations.

The illustrations consist of a number of photographs, obtained from the United States Department of Agriculture, of the trees of the Pacific slope, which were used to illustrate Professor Sudworth's excellent work on that subject, of plates made from photographs of the leaves and flowers of shrubs, and of other photographic illustrations obtained within the Province.

In making use of the words "The Dry Belt" I mean that portion of the Mainland where the precipitation is so light that irrigation is necessary for growing crops. "Eastward of the Coast Range" means all that part of the Mainland between the Coast Range and the Rocky Mountains. "The Upper Country" and "The Upper Mainland" have the same meaning. "Westward of the Coast Range" means that part of the Mainland between the Coast Range and the sea, sometimes called "The Wet Belt." "The Coast of the Mainland" and "The Lower Mainland" have the same meaning. "The Island" means Vancouver Island. "The Islands" mean the Islands of the Gulf of Georgia and Straits.

I have to express my acknowledgments to my friend Mr. C. C. Pemberton for his assistance in obtaining the plates mentioned and in other matters.

J. R. ANDERSON.

Victoria, September, 1925.

The forest conserves our water supply; a woodland stream. Photo. Trio, Victoria.

EXPLANATION OF SCIENTIFIC TERMS USED.

ACUMINATE—Drawn out into a long point.
AMENT—A catkin; a deciduous unisexual spike.
ANTHER—The part of the stamen containing the pollen.
AXIL—The upper angle where the leaf joins the stem.
BRACT—A leaf more or less changed in form, from which a flower or flowers proceed.
CATKIN—Same as Ament.
COMPOUND LEAVES—A leaf formed of several leaflets, like the Sumach and Walnut.
CORDATE—Of leaves, heart-shaped at the base.
CORYMB—A flat-topped or convex open flower-cluster, whose flowers open from the outside, inward.
CYME—A flower-cluster with the flowers opening from the centre outward.
DECIDUOUS—Falling, said of trees and shrubs whose leaves fall in the autumn.
DIŒCIOUS—Staminate and pistillate flowers on different plants.
DRUPE—A stone-fruit.
FASCICLE—A close cluster of leaves or flowers.
LOBE—One of the divisions of leaf or flower.
PANICLE—A loose compound flower-cluster.
PEDICEL—The stalk supporting a single flower in a cluster.
PEDUNCLE—A general flower-stalk supporting either a cluster of flowers or a solitary flower.
PERSISTENT—Said of leaves remaining on the branches over their first winter.
PETIOLE—The foot-stalk of a leaf.
PISTIL—The seed-bearing organ of a flower.
PISTILLATE—Applied to a seed-bearing flower or plant.
POLLEN—The powdery matter contained in the anthers.
PUBESCENCE—A covering of soft short hairs.
RACEME—A primary axis bearing flowers on pedicels.
SERRATED—Like the teeth of a saw.
STAMEN—One of the pollen-bearing organs of a flower.
STAMINATE—Said of unisexual flowers without pistils.
TRIFOLIATE—Three-leafed.
UMBEL—Inflorescence in which numerous stalked flowers arise from one point.
WHORL—An arrangement of branches or leaves in a circle round an axis.

BOTANICAL AUTHORITIES.

Ait.—Aiton, William (1731–1793), English.
Aiton, W. T. (1766–1849), English.
Balf.—Balfour, John Hutton (1808–1884), Scottish.
Banks—Banks, Sir Joseph (1743–1820), English.
Bentham—Bentham, George (1800–1884), English.
Brew. & Wats.—Brewer, William Henry (1828–?), American.
(Watson; *see* below).
Carr.—Carriere, Eli Abel (1816–1896), French.
Cham. & S.—Chamisso, Adalbert von (1781–1838), German.
Schlechtendahl, Diedrich (1794–1866), German.
DC.—DeCandolle, Augustin P. (1778–1841), French.
Decne. & Planch.—Decaisne, Joseph (1809–1882), French.
Planchon, Jules Emile (1833–1900), French.
Desf.—Desfontaines, Rene L. (1755–1833), French.
Don—Don, George (1798–1856), English.
Dougl.—Douglas, David (1799–1834), Scottish.
Engelm.—Engelmann, George (1809–1884), American.
Forbes—Forbes, John (1799–1823), Scottish.
Gord.—Gordon, George (1806–1879), Irish.
Gray—Gray, Asa (1810–1888), American.
Haw.—Haworth, Adrian Hardy (1772–1871), Scottish.
Hook.—Hooker, Sir William J. (1785–1865), English.
Hooker, Sir Joseph Dalton (1817–1911), son.
James—James, Thomas Potts (1803–1882), American.
Kalm—Kalm, Peter (1715–1779), Swedish.
Ker—Ker, John Bellenden (1765–1871), Scottish.
Koehne—Koehne, Emil, German.
Lamb.—Lambert, Aylmer Bourke (1761–1842), Irish.
Lawson—Lawson, George (1827–?), Scottish.
L'Her.—L'Heritier de Brutelle, C. L. (1746–1817), French.
Lindl.—Lindley, John (1799–1865), English.
Linn.—Linnaeus: Linne, Carl von (1707–1778), Swedish.
Linne, Carl von (1741–1783), son.
Maxim.—Maximowicz, Karl J. (1827–1891), Russian.
Michx.—Michaux, Andre (1746–1802), French.
Mill.—Miller, Philip (1669–1771), English.
Mocino—Mocino, Jose (1760–1819), Mexican.
Muhl.—Muhlenberg, Henry Ludwig (1756–1817), American.
Nutt.—Nuttall, Thomas (1786–1859), American.
Pall.—Pallas, Peter Simon (1741–1811), Russian.
Parl.—Parlatore, Filipe, Italian.
Piper—Piper, Charles Vancouver, American.
Poir.—Poiret, Jean L. M. (1755–1834), French.
Presl— Presl, Karel Boriweg (1794–1852), Bohemian.
Pursh—Pursh, Fred. T. (1774–1820), German.
Raf.—Rafinesque-Schmaltz, C. S. (1784–1842), American.
Regel—Regel, Eduard von (1815–1892), German.
Rehd.—Rehder, Alfred, American.
Rich.—Richard, Louis C. M. (1754–1821), French.
Richards.—Richardson, Sir John (1787–1865), English.

ROEM.—Roemer, Johann Jacob (1766–1819), Swiss.
Roemer, M. J. (?), Swiss.
RYDB.—Rydberg, Per Axel, American.
SARG.—Sargent, Charles Sprague, American.
SMITH—Smith, James Edward (1759–1828), English.
SPRENG.—Sprengel, Kurt (1766–1833), German.
T. & G.—Torrey and Grey; *see* under their names.
TORR.—Torrey, John (1796–1873), American.
WALP.—Walpers, Wilhelm G. (1816–1853), German.
WATS.—Watson, Sereno (1826–1892), American.

Douglas Fir, Vancouver Island. Photo. Trio, Victoria.

A FOREST HYMN.

THE groves were God's first temples. Ere man learned
To hew the shaft, and lay the architrave,
And spread the roof above them,—ere he framed
The lofty vault, to gather and roll back
The sound of anthems; in the darkling wood,
Amidst the cool and silence, he knelt down,
And offered to the Mightiest solemn thanks
And supplication. For his simple heart
Might not resist the sacred influences
Which, from the stilly twilight of the place,
And from the grey old trunks that high in heaven
Mingled their mossy boughs, and from the sound
Of the invisible breath that swayed at once
All their green tops, stole over him, and bowed
His spirit with the thought of boundless power
And inaccessible majesty. Ah, why
Should we, in the world's riper years, neglect
God's ancient sanctuaries, and adore
Only among the crowd, and under roofs
That our frail hands have raised? Let me, at least,
Here, in the shadow of this aged wood,
Offer one hymn—thrice happy, if it find
Acceptance in His ear.

Father, Thy hand
Hath reared these venerable columns, Thou
Didst weave this verdant roof. Thou didst look down
Upon the naked earth, and, forthwith, rose
All these fair ranks of trees. They, in Thy sun,
Budded, and shook their green leaves in Thy breeze,
And shot towards heaven. The century-living crow,
Whose birth was in their tops, grew old and died
Among their branches, till, at last, they stood,
As now they stand, massy, and tall, and dark,
Fit shrine for humble worshipper to hold
Communion with his Maker.

This mighty oak—
By whose immovable stem I stand and seem
Almost annihilated—not a prince,
In all that proud old world beyond the deep,
Ere wore his crown as loftily as he
Wears the green coronal of leaves with which
Thy hand has graced him.

—*William Cullen Bryant.*

The forest protects our woodland flora; erythroniums in bloom. Photo. Trio, Victoria.

Trees and Shrubs of British Columbia.

CONIFERÆ.

DOUGLAS FIR.

*Pseudotsuga Douglasii,** Carr.; *Pseudotsuga mucronata,†* Raf.

THIS tree is often misleadingly called Oregon Pine, also Red Fir, but is commonly known as Douglas Fir, after David Douglas, a more appropriate term in every respect.

This is the principal commercial wood of the Province, the uses to which it is put, and for which it is adapted, being legion. In earlier times it was not considered good enough for fine work, and was utilized altogether in the construction of houses, ships, bridges, wharves, and all such heavy coarse work, but of late it has assumed a foremost position in fine work, such as panelling and cabinetmaking; its grain, when the wood is cut in the proper manner to show it, is unexcelled in beauty. Stained to represent Oak or Walnut, and polished, it makes a most excellent substitute for those woods. Its own intrinsic qualities, however, are quite sufficient to ensure it a first place in the public favour. Growing in the open, the Douglas Fir begins branching out from the ground, the limbs attaining a great size, and extending at the base in old trees to a distance of 20 to 30 feet or more all round. Such trees are highly ornamental and make most desirable shelter from the weather, but are commercially valueless, except for firewood, and even for that purpose are not of much value, in consequence of the difficulty in reducing the wood to a suitable size on account of the huge knots. The commercially valuable tree grows in dense forests, usually in company with Western Red Cedar, Hemlock, and White Pine. In such situations it attains a great size and height, anywhere from 4 to 8 feet in diameter and limbless for 100 to 150 feet. The heads form a dense shade and the ground underneath is usually carpeted with mosses, ferns, and small shrubs. The variableness of this tree, owing to climatic causes, environment, and other conditions, and its great range of habitat, serves greatly to perplex the tyro. In old trees growing in forests, the bark, of a deep brown colour and scored in deep furrows, attains a thickness anywhere up to 14 or even 20 inches, whilst in second-growth trees it is comparatively smooth and light coloured, with an average thickness of 1 inch or thereabouts. In saplings the smooth whitish bark has cells containing liquid gum, resembling those of the Balsam Fir, for which it is apt to be mistaken.

The agreeable orange-like odour is quite characteristic, differing materially from that of the Balsam and other conifers. In the case of old trees the branches usually grow almost at right angles to the trunk but inclined upwards. The leaves, a bright green, about an inch long, narrow, flat, somewhat pointed and grooved on one side, are set thickly round the branchlets. In young trees the branches incline distinctly upward, and the leaves are more pointed, more slender, and not so densely set. In some cases the branchlets are from 2 to 3 feet long

---

* *Douglas's; after David Douglas, a Scottish botanist who spent several years on the Pacific Coast a century ago.*

† *Pointed; referring to the points on the cone bracts.*

Pseudotsuga Douglasii (P. mucronata).

and thread-like, hanging perpendicularly from the limbs, but usually the characteristic branchlet is much shorter and more rigid. The first-mentioned form is observable more particularly in the arid portions of the country.

The cone is the most characteristic feature of the tree, the one by which seed-bearing individuals can readily be identified. It is usually about 3 inches in length and from 1 to 1½ inches in diameter. The scales, which open widely when mature, have peculiar bracts attached to, or rather between, them; these bracts are three-pointed, the centre being a sharp-pointed spine extending beyond the other two, which are broad. The colour of the cone is greenish when young, turning to a light brown when mature. The seeds ripen about August and soon drop out of the cones; it is of consequence, therefore, that seed-collectors should not delay gathering the cones beyond the early part of August.

The range is pretty well all over the Province, south of the 51st degree of latitude, being found at sea-level, and sparsely up to altitudes of 5,000 or 6,000 feet. It attains its greatest perfection to the westward of the Coast Range, where it is found in great abundance. To the eastward of that range, whilst in some sections it is not scarce, it never attains any great size, and the wood is altogether inferior to that found nearer to the Coast. It becomes scarce in the northern part of the Province, and on the littoral of the west coast of Vancouver Island it gradually recedes to the higher lands.

It is hard to say what age our forest trees attain—greater no doubt than many imagine—probably many hundreds of years. Therefore, does it not seem almost a sacrilege that these venerable monuments of bygone years should be so ruthlessly sacrificed to the wants of man, born but yesterday—nay, too often simply destroyed either wantonly or carelessly?

In reference to specimens of Douglas Fir and bark sent to the Technological Museum at Sydney, N.S.W., the Curator, Mr. Richard T. Baker, wrote as follows:—

"I have to acknowledge the receipt of your letters of 21st August and 16th September in reference to the specimen of Fir for this Museum, and to inform you that the specimen has since been safely received in splendid condition. I must tender you my sincerest thanks for your great kindness in procuring so fine a product of Canadian forestry. Such a noble specimen is highly appreciated and greatly admired. I am having the surface polished so as to bring out the annual rings, against every hundred of which I intend to have painted the dates of some principal events of the Empire's history.

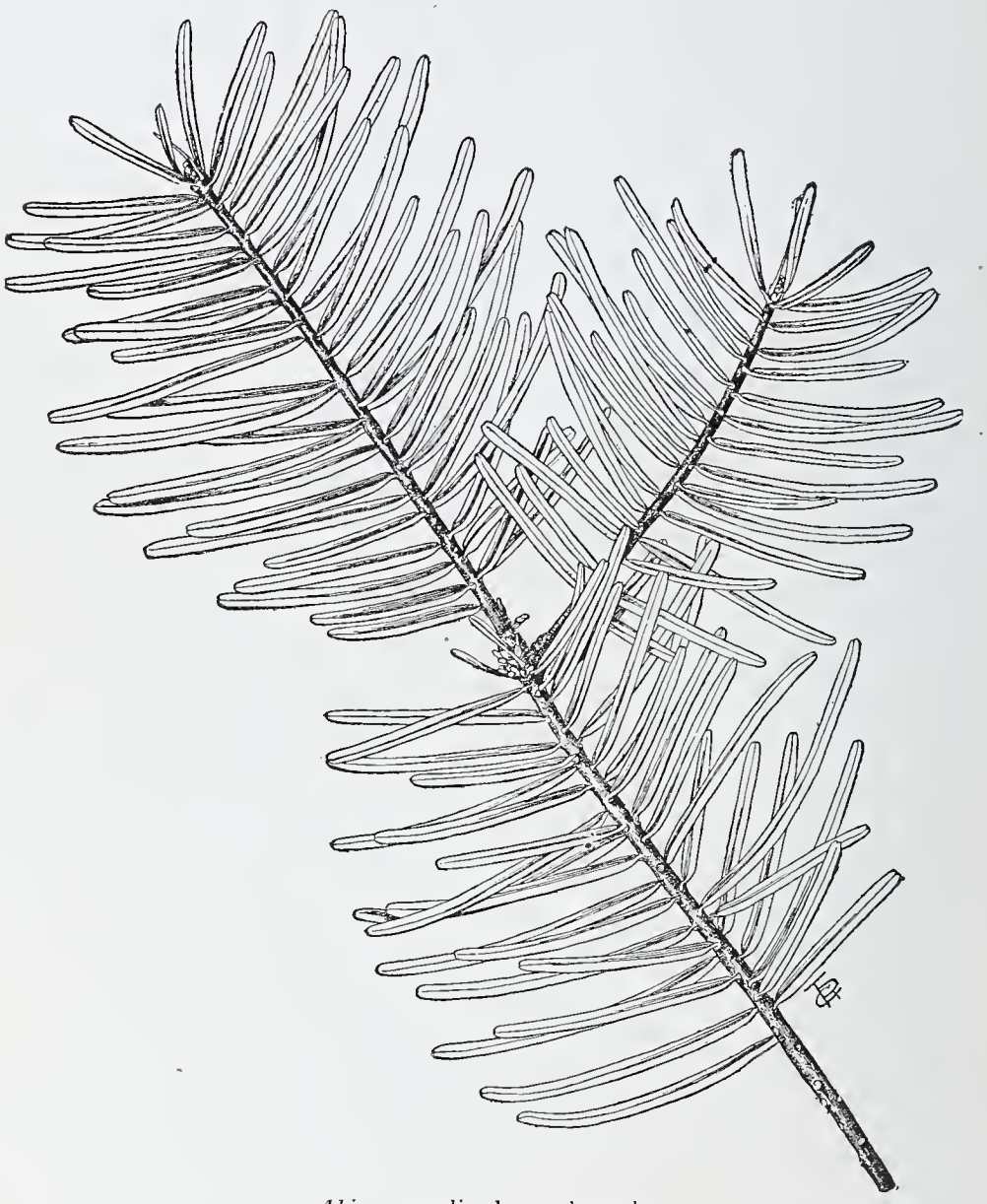
"The rings number 574, so, assuming it was cut down in 1900, it was probably a seedling when Edward III. ascended the English Throne, say 1387—only 300 years after those thirty-five hardy Norsemen under Leif, son of Eric of Iceland, landed on the New England Coast; a little over 100 years before the 'Santa Maria' grated upon the shelving beach of San Salvador Island; and 300 years before the 'Half Moon' sailed into the Hudson.

"The specimen of Fir bark received from your Department some time ago forms a fitting coronet to this sample of the same species, for, working out the age data, that specimen must have come from a tree nearly 3,000 years old! I often wonder what the diameter of that tree must have been."

WESTERN WHITE FIR; LOWLAND BALSAM FIR.

*Abies grandis,** Lindley.

This tree is a common one in the Province to the westward of the Coast Range, both on the Mainland and the Islands, in alluvial bottoms, valleys, and damp hillsides, but not at any great altitude. Whilst widespread, it does not occur in as great quantities as most of the other conifers. It is well designated



Abies grandis: lower branch.

grandis, as it is a grand tree, but too stiff and formal to be quite pleasing. It is, nevertheless, very handsome when growing in the open, forming a perfect cone. When growing in forests it loses its symmetrical shape, and is usually jagged and ungainly from the dead limbs which adhere for a long time to the lower part of the trunk.

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* *Grand, large.*

It attains a good size, from 3 to 5 feet in diameter and 150 to 200 feet high. It is called Balsam Fir on account of the quantity of gum contained in large cells on the bark of young trees, the colour of which is a greyish-brown, smooth and shining. As the tree grows older these cells disappear and the bark becomes rough, but still comparatively smooth as compared with many other conifers. Its colour becomes a light brown with patches of grey and the thickness is seldom over 1 inch. The branches never grow to the great size of those of the

Abies grandis: middle crown branch.

Douglas Fir, and therefore the individual tree does not cover as large an area of ground. With its branches sloping downward and its dense foliage, it is second to none in affording protection from the elements. In young trees the branches grow out in regular whorls, and the leaves, which are flat, an inch or more in length, dark glossy green on the upper sides and distinctly whitish on the lower, are placed very regularly on each side of the branchlets. As the tree attains age, so the leaves become thicker and shorter, and also more irregularly placed round the branchlets. The cones, from 3 to 4 inches in length and about

2 inches in thickness, are very compact and covered with an exudation of gum. At maturity they become very fragile, when the scales open out and allow the seeds to escape, after which the cones soon fall to the ground and go to pieces. The characteristic, strong, pungent, but agreeable odour distinguishes this from all the other coniferous trees of this Province. The gum which exudes from the cells previously described shares this peculiar odour and forms an excellent ointment, mixed with lard, for cuts and bruises. The wood, which is white, light, odourless, and free from resin, is not used commercially, but it would no doubt make excellent boxes for fruit and other products. As it decays quickly,

Abies grandis: very ripe cone: *a*, seed.

however, it is not a suitable wood for outside work, and on account of its lightness and lack of density it is all but useless for firewood.

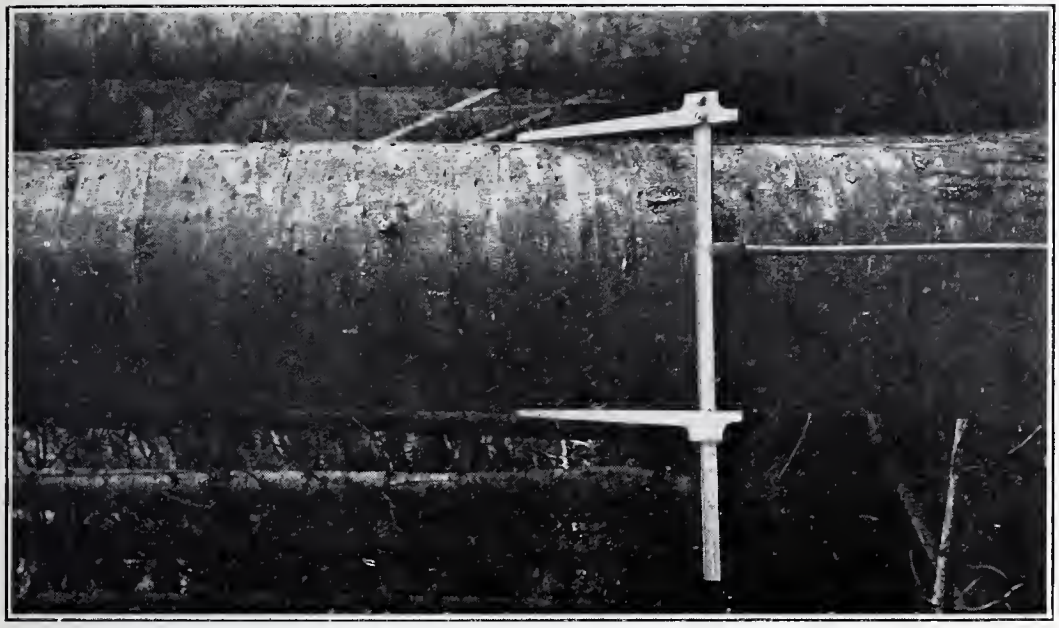
MOUNTAIN BALSAM FIR; ALPINE BALSAM FIR.

*Abies subalpina,** Engelmann; *Abies lasiocarpa,*† Nuttall.

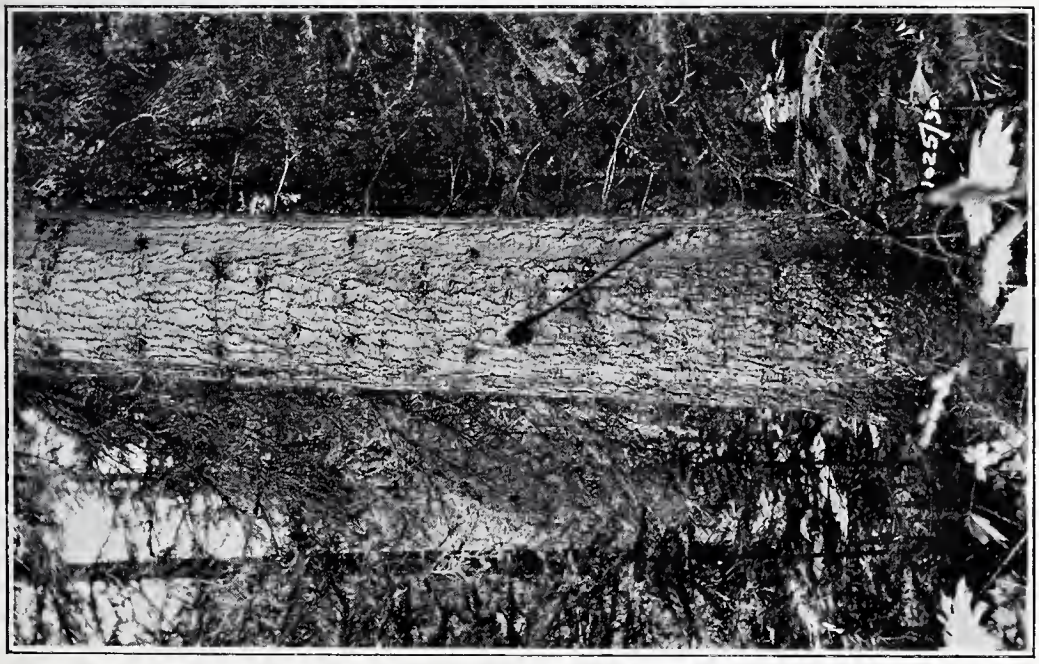
This is a congener of the Western White or Lowland Balsam Fir, and, as its name indicates, is a mountain tree, occurring at altitudes of 5,000 feet and over. It resembles the other in many respects, but naturally, from the con-

* *Below alpine; growing near the timber-line.*

† *Hairy-fruited; the cone scales are covered with minute soft hairs.*



Lowland Balsam Fir trunk; height 123 feet, diameter 23 inches, age 120 years. Photo. Forestry Dept.



Mountain Balsam Fir, in valley of Horsefly River, Cariboo F.D. Photo. Forestry Dept.

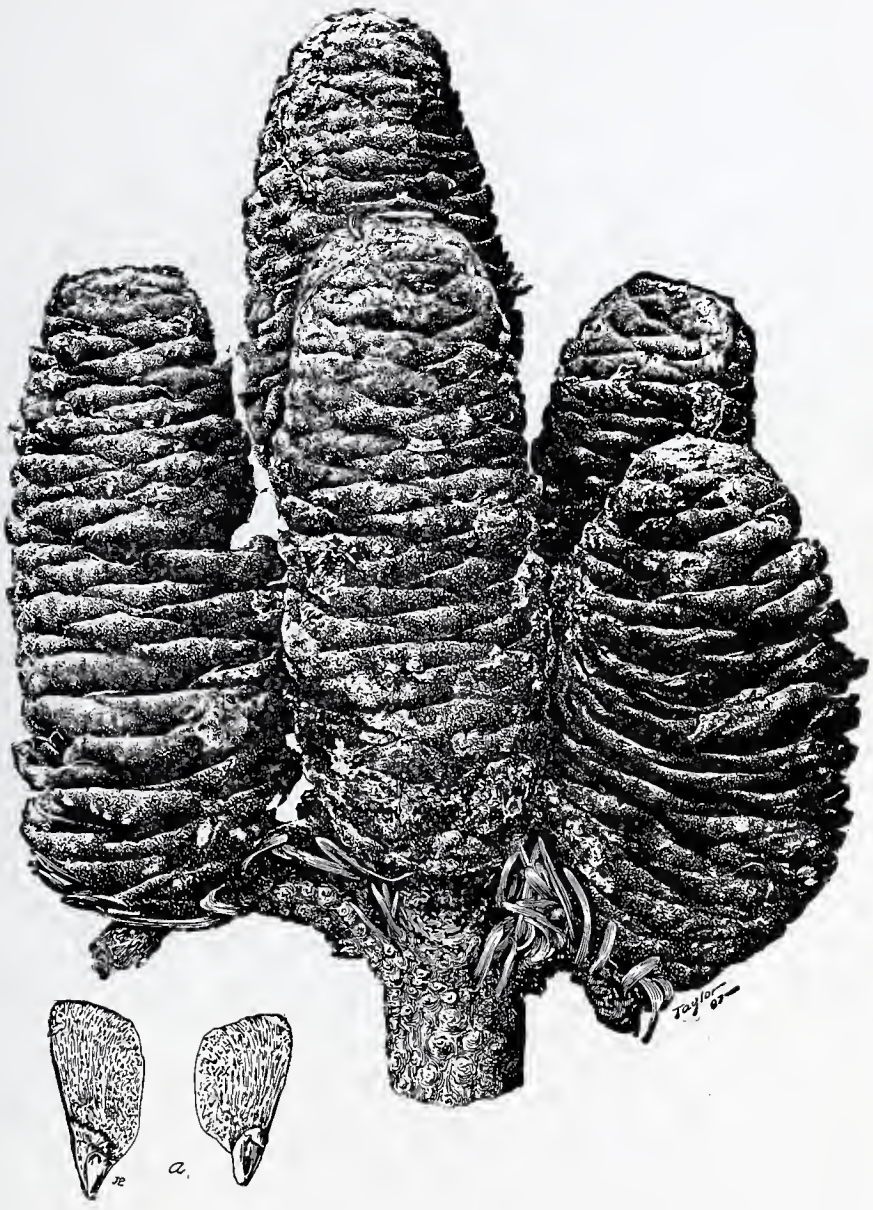
ditions of its alpine habitat, it is more stunted in its growth. As in the case of other alpine trees, snow often bends the branches down, so that the lower limbs lie flat on the ground, and the upper branches in their turn lie on the others, the whole forming a dense and impenetrable covering to the ground beneath. The height of this tree is usually from 60 to 80 feet, with a diameter

Abies lasiocarpa (A. subalpina).

of 2 to 3 feet, and less in exposed situations. In more protected situations it attains a greater size, a diameter of from 3 to 4 feet and a height of 100 feet or more being common.

The bark even on old trees is unusually smooth, very light coloured, often light grey or almost white, and seldom deeply scored. The leaves, as is usual

with trees at high altitudes, are more rigid than those of its congener on the lower lands and are not so regular in their manner of growth, covering the branchlets thickly all round. The colour is a deep sombre green and the odour very strong, pungent, and rather overpowering. The cones are the most distinctive feature, occurring as they do in clusters, standing upright when immature, of a dark-purple colour, turning to brown as they attain maturity, and always covered with an exudation of gum. The full-grown cone is about 2 inches in



Abies lasiocarpa: very ripe cones; *a*, seed.

length and 3 inches thick, very dense and heavy, forming a missile of no mean capacity when detached by squirrels from the tops of high trees, in which work these little animals are busily engaged about the month of September, when the seed is about ripe. After the scales open the cone becomes fragile and easily falls to pieces when handled. The wood, white and soft, is not used commercially, and indeed from the inaccessibility of the tree could not be marketed profitably, as long as other woods are so easily obtained.

PA Dept of Environmental Protection

AMABILIS BALSAM FIR.

*Abies amabilis,** Forbes.

This Fir is also known as the White or Silver Fir from the appearance of its smooth grey bark, dappled with white. The slender grey trunk, the cone-like head of rich green foliage, and the gracefully drooping branches have won for it the specific name of "*amabilis*," the lovely. The leaves are usually notched on

* *Lovely.*

Abies amabilis: lower branch.

young trees and on the lower branches of older ones, but on the topmost ones they are sharply pointed, shorter, and, instead of the ordinary flattened arrangement in the branchlet, they here stand up stiffly. The purple cones are of much larger diameter than those of the Alpine Balsam Fir and are not grouped in the same manner. Its habitat is from the westward side of the Coast and Cascade Ranges to Vancouver Island. It is as yet little used for lumber.

Abies amabilis: upper branch and cone: *a*, seed.

WESTERN RED CEDAR.

Thuja gigantea,* Nutt.; *Thuja plicata*,† Don.

This wood, commercially known in this Province as Red Cedar, has been known also as the Western White Cedar, the common name accorded to it by Macoun, a name, like many others, quite inappropriate, as, far from being white, the wood is distinctly red. This tree must not be confounded either with the Juniper, which is called Red Cedar, or with the White Cedar of the East, or with that of California.

This is one of our most ornamental trees, growing to an enormous size, and, when not too thickly surrounded by other trees, affording the best of shelter

* *Large, gigantic.*

† *Folded; referring to the "infolding or fluting" at the base of the trunk.*

either from winter storms or summer sun. The trunks, out of which the large Indian canoes are made, are large at the butt, with deep depressions, but do not carry their size up like the Douglas Fir. Nevertheless, from the fact that canoes 60 feet long and over are constructed from the trunks, it may be judged that they are quite large for a long distance up, especially when it is considered that

Thuja gigantea (T. plicata).

in order to avoid the depressions or flutings the tree is cut some distance from the ground. The branches start out from the trunk in a downward direction, turning up at the ends. Like other trees in dense forests, the lower limbs die away from lack of sunlight, leaving the trunk bare for the distance mentioned. In trees growing in the open, the limbs, with the weight of years and the natural

tendency to droop, touch the ground all round, so that it is sometimes difficult to reach the trunk. The leaves resemble those of other members of the *Arbor-vitæ* family, to which this tree really belongs, have a strong characteristic and agreeable odour, are quite flat in young trees, but assume a thickened form in the older stages.

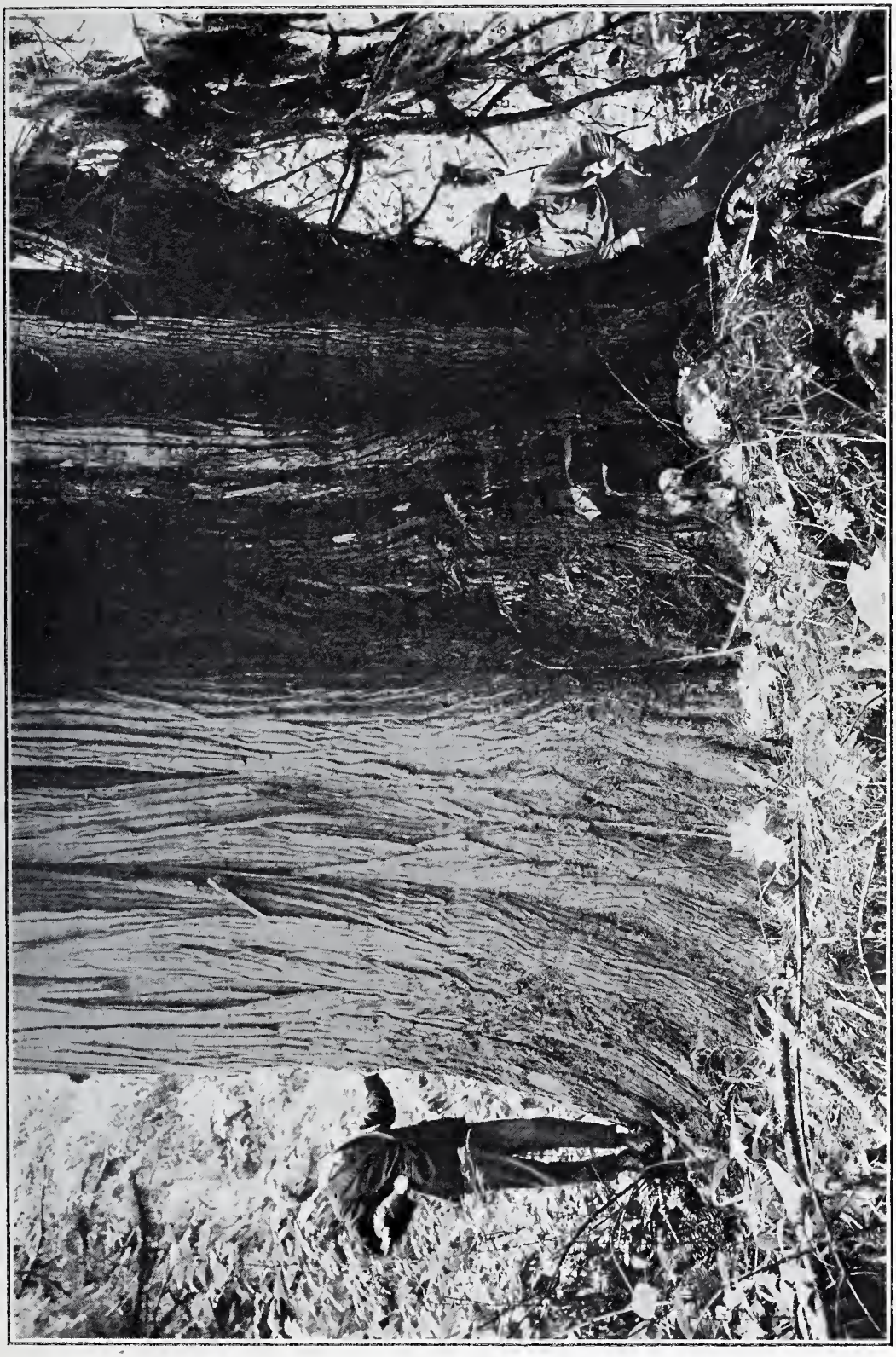
Thuja gigantea (T. plicata): a, branch with open cones; *b*, seed.

The cones, of a light-brown colour, are quite small—not more than ½ inch across—and are thickly set on the upper sides and at the ends of the branches. The seed is about ⅛ inch long, with wings on each side, and matures about September. The bark is never thick, even on old trees, 1 inch being probably the limit, ½ inch and less the ordinary thickness. When the sap is rising the bark is easily detached from the trunk, at which season the Indians lay by stores

of it by tearing off long strips, which they make use of in various ways, for baskets, mats, clothing, ropes, etc. On the outside the bark is of a greyish colour and scored, particularly in old trees. The scores are lengthwise, running into one another at sharp angles. The interior is of a cinnamon-red, the part next the trunk being smooth and quite strong, and is the part used in baskets and for finer work. The bark is very useful also for roofing and enclosing rough

Group of Western Red Cedar trunks, B.C. Photo. Leonard Frank.

shacks, affording the pioneer settler a ready means of protection from the weather. The wood is of a reddish-brown colour, with a strong odour not particularly pleasant, splits beautifully, is very ornamental for cabinet and inside work when cut with these objects in view, and although soft is durable for posts and outside work. Shingles of the best quality are made entirely out of it. It is unfortunately the fact that owing to the inflammable nature of the wood, the very



Base of Western Red Cedar, Vancouver Island. Photo. Trio, Victoria.

slight protection afforded by the bark, and the frequency of hollow butts, this beautiful and useful tree is very subject to destruction by fire.

It may here be mentioned that the great difference in the appearance of the foliage in young seedlings and older trees is such as to cause great confusion in attempts at identification by the beginner. This is true of most conifers, but particularly so of Cedars, Cypresses, and Junipers, and I would therefore warn beginners against errors which are naturally caused by such differences. The natural habitat of the Cedar is moist rich bottoms, the roots extending long distances horizontally, 50 to 60 feet, in search of congenial food and moisture. The range extends all over the seaboard of the Province, on the slopes of the Selkirks and other mountains, and in patches throughout the Interior where the humidity is sufficient for its requirements. The finest specimens are to be found to the westward of the Coast Range, especially on the west coast of Vancouver Island.

Section of Western Red Cedar sent to Empire Exhibition, Wembley, by Abernethy-Lougheed Logging Co.; diameter 114 inches. Photo. Leonard Frank.

YELLOW CEDAR; YELLOW CYPRESS.

*Chamæcyparis nootkatensis,** Lamb.

The range of this tree is all over Vancouver Island (beyond an altitude of 4,000 feet only in scattered groups), Queen Charlotte Islands, where it attains its greatest perfection, and the sea-coast of the Northern Mainland. It does not grow to any great size in the southern part of the Province, but in the north it is reported to attain a diameter of 6 feet and a height of 100 feet. These

* *Belonging to Nootka.*

Chamæcyparis nootkatensis: a, seed, natural size and twice natural size.

dimensions are, however, the outside limit. Growing in the open, the branches extend pretty well at right angles from the trunk, and the branchlets hang down like those of the Weeping Willow, giving the tree a very graceful appearance.

The leaves resemble those of the Juniper and have a peculiar pungent odour quite distinct from that of either our Cedar or Juniper. The flowers, tiny and yellowish-white, occur thickly along the ends of each spray. The cones are small, about the size of the largest garden pea, round and compact, borne singly at the ends of the branchlets and green until ripe, about October, when they turn a greyish-brown. When ripe the cone splits open at the top and allows the seed

Yellow Cedar, Prince Rupert District.
Photo. Forestry Dept.

to escape. The bark in young trees is smooth, of a mahogany-red colour, and quite thin; in older trees it presents a rough surface on the lower part, somewhat grey, with a shreddy exterior. The wood is close-grained, quite yellow, with a strong and rather pleasant odour, which it retains indefinitely and which is said to be objectionable to insects. It splits well, is easily worked, and when polished resembles boxwood. The Indians in the North make canoes of the wood and also use it extensively for paddles and carvings, the close grain lending itself admirably to the latter purpose. For inside finishing, fine cabinet-work, and similar purposes its qualities certainly entitle it to first rank.

ROCKY MOUNTAIN JUNIPER; PENCIL-WOOD.

*Juniperus scopulorum,** Sargent.

The name of this tree has been so bandied about that it is with the utmost difficulty identification is possible. It is to be hoped that the name now suggested by Professor Sargent may remain. This tree is found pretty well all over the Province on exposed points, generally growing in a stunted form, seldom over a foot in thickness, with a height of from 10 to 40 feet, and very much branched, but occasionally attaining a diameter on Vancouver Island of from 2 to 4 feet.

Juniperus scopulorum.

The leaves, resembling those of the native Cedar, but more compact, are a greyish-green with a strong pungent odour. The berries, borne very profusely on some individuals and about the size of a large red currant, are blue, covered with a white bloom. On seedlings or very young trees, and often on the lowest branches of mature trees, the foliage is of quite a different character, being spiny, which characteristic disappears later. This peculiarity often deceives the uninitiated. In my experience this is a dicœcious tree; that is, the individuals are of different sexes, some individuals bearing fruit regularly every year, and others not.

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* *Of rocks; probably from having been first seen on rocky shores.*

The wood is fine-grained, red, with the characteristic perfume of pencil-wood. Some years ago I was applied to by a firm of pencil-makers in England as to the possible supply of the wood in this country, as the sources from which the present supply was being obtained were becoming exhausted. I regret to say that I was unable to report favourably, as it does not occur in sufficient quantities in any one place. As, however, it is only wanted in lengths of a little over 7 inches to be cut to the thickness of pencils, it may even under present conditions prove remunerative to any one entering the business. The bark is stringy and grey in colour and in old trees breaks into scores, which run diagonally into each other.

Juniperus scopulorum: a, seeds.

COMMON JUNIPER.

*Juniperus communis,** Linn.

There seems to be some confusion regarding the proper name of this shrub; that given above is that adopted by Professor Macoun. Personally, I should prefer a specific name signifying "Prostrate," as the shrub which is now under review usually lies in that position, seldom over a foot high, but with branches

* *Common.*

10 to 12 feet long, extending all round and so covering large spaces. It differs from the other Juniper in its foliage, preserving the spiny or prickly form of leaf all through life, which form disappears in adult trees of *J. scopulorum*. The colour is bluish-green. The fruit is possibly larger, but of the same blue colour as in *J. scopulorum* and is covered with a white bloom. The characteristic odour of the Juniper is very pronounced in this species. Its range is very great, being found all over the Province, on high mountains, and in sterile rocky situations.

A group of Western Hemlock, B.C. Photo. Leonard Frank.

WESTERN HEMLOCK.

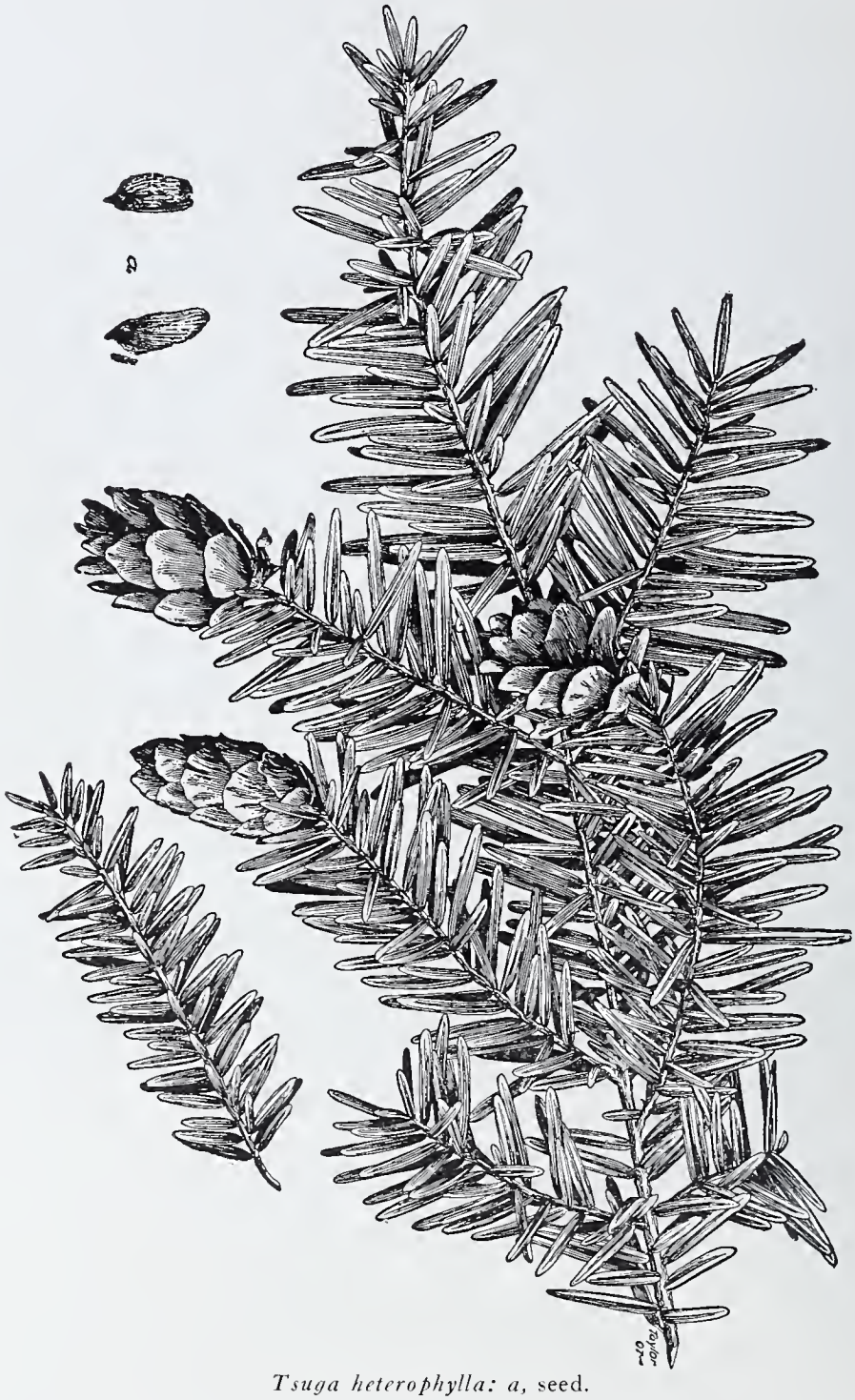
*Tsuga heterophylla,** Sargent.

Hemlock is the rather puzzling name that this tree, which grows commonly throughout the Province, is known by. Why, or how, it came to be called by this apparently inappropriate name I cannot explain: Hemlock proper being a very poisonous deciduous water-plant belonging to the natural order Umbelliferæ, sometimes called Wild Parsnip; therefore to the uninitiated the name as applied to a large tree is naturally most perplexing. It is one of our largest trees, vying with the Douglas Fir in size, often growing in dense gloomy forests with little

* *Other-leafed.*

or no undergrowth; it also frequently occurs amongst other forest trees, where conditions are suitable.

Its natural habitat is the humid valleys and hillsides of the Coast, up to an altitude of about 2,000 feet; above that it gradually diminishes in size and gives

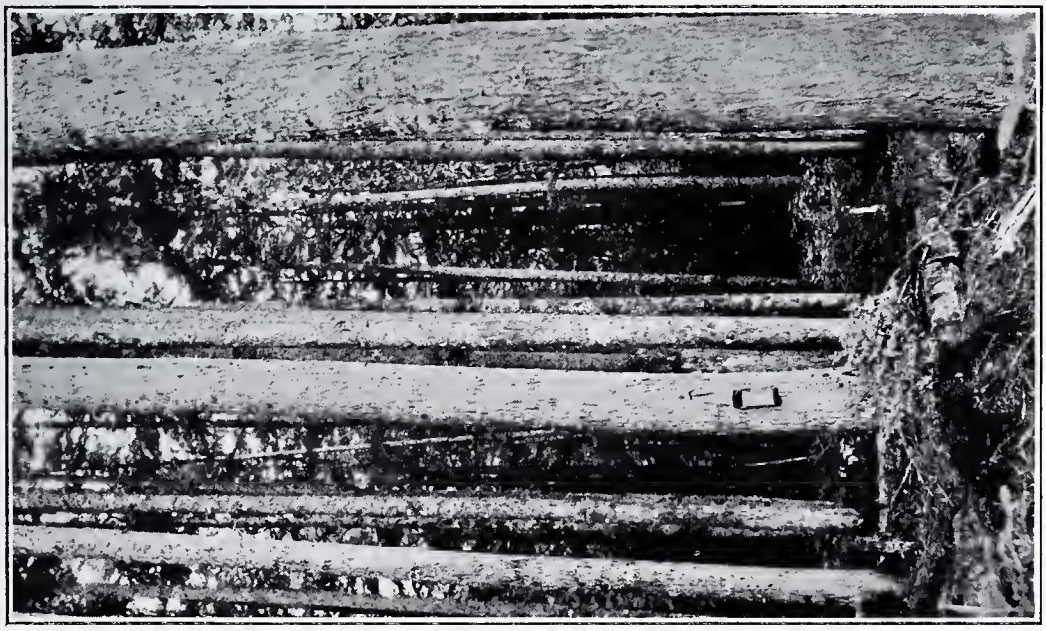


Tsuga heterophylla: a, seed.

place to its congener, the Mountain-hemlock. In the drier regions of the Interior it seldom reaches the dignity of a large tree.

It is a shallow-rooted tree, the roots often only covered with moss near the trunk, and consequently peculiarly liable to destruction from forest fires. The

Western Hemlock, Read Bay; height 178 feet, age 145 years. Photo. Forestry Dept.



Western Hemlock, Kitimat River. Photo. T. A. Clarke.

range equals that of Douglas Fir, and in many places quite supersedes it, particularly in the North and on Queen Charlotte Islands. The bark is never very thick, 1 or at most 1½ inches, of a dark greyish-brown colour, finely divided by shallow scores, longitudinally and horizontally. In that respect it closely resembles our White Pine, *Pinus monticola;* so much so that it is often necessary to ascertain the species by the foliage. The branches droop a good deal towards the ends, although starting upwards from the trunk. The branchlets are thickly covered with short flat leaves, placed on each side of the stem, and in the younger stages closely resembling the native Yew. The terminal branches and tops being slender and drooping, this tree is amongst the most graceful of our many and handsome conifers and deserves a place in any arboretum. The odour of the foliage, whilst not altogether pleasing, is peculiar and very characteristic, so that once experienced it is a ready means of identification.

The cones are very small, not more than ¾ to 1 inch long, placed numerously at the ends of the branches and on the upper sides in the same manner as those of the Cedar. About August the seeds are shed and the cones drop during the succeeding winter, the ground under old trees being thus thickly covered with old cones. Until recently the wood was not utilized for lumber in this Province; it is now, however, coming into general use for inside work and other purposes where it is not exposed to the weather. It is of about the same density as Douglas Fir, light coloured and close-grained. The bark contains a very large percentage of tannin and is therefore extensively used in tanning leather. Western Hemlock is now one of the most-used species for the manufacture of pulp-wood.

MOUNTAIN HEMLOCK.

Tsuga Mertensiana,* Sargent.

In appearance this tree differs greatly from its congener, being rigid and ungraceful. Its thick impenetrable foliage would naturally lead one to the belief that it would form an excellent shelter from rain; such, however, is not the case, as I have found to my cost when caught in bad weather on mountain-tops. This is due to the fact that the branches slant towards the trunk, thus allowing the water to run inwards. As the common name indicates, it is altogether an alpine tree, its natural habitat being at altitudes from 4,000 feet up to snow-line. It consequently never grows to any great size; in groups and in more favoured situations it reaches 80 to 90 feet, whilst in exposed localities is it stunted and gnarled. One specimen of its wood in my possession, cut on Mount Arrowsmith by Mr. Stevenson, of Wellington, during one of our excursions, measures some 9 inches in diameter and is shown by its rings to have been 200 years old although the tree itself was not more than 25 feet high. This tree therefore was contemporaneous with events that happened a long time previous to the stirring events connected with the discovery of the straits and inside passage by Vancouver in 1792, and the subsequent relinquishment of the country by Spain in 1795.

The bark is seldom over an inch thick, oftener thinner, deeply scored in old trees and scaly in the younger, of a cinnamon-brown colour with greyish patches. The leaves are thick and stumpy, about 1 inch long, closely set all round the branchlets, and in that respect differing materially from its valley congener. The colour, a bluish-grey, presents a rather sombre appearance. The cones also are very characteristic, being long and slender, some 2 inches and over in length and about ½ inch in thickness, of a beautiful purple colour when immature, and

* *Mertens'; after Mertens, a German botanist.*

standing erect at the ends of the branchlets. The characteristic odour of the Hemlock is preserved in this species, but more pronounced and pungent, as in all alpine conifers.

Tsuga Mertensiana: branch with closed cones: *a*, seed.

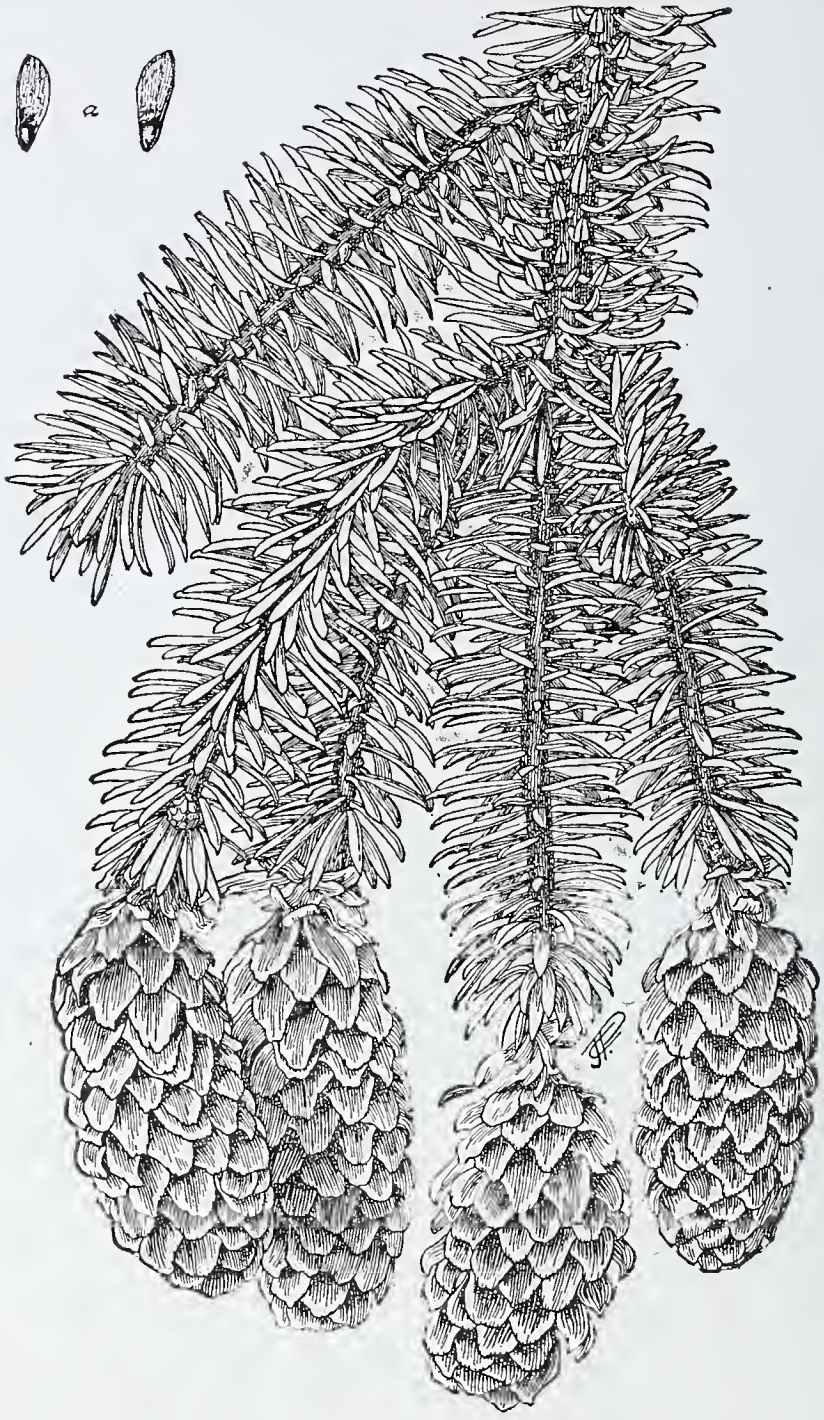
SITKA SPRUCE; TIDELAND SPRUCE.

*Picea sitchensis,** Carr.

These are the names recognized in Canada for this fine tree. Its range is all over the littoral of the Mainland and Islands extending to the northern

* *Belonging to Sitka.*

boundary of the Province, on the west coast of Vancouver Island, and to the northward on the Mainland. It, in a great measure, replaces the Douglas Fir near the sea, the latter receding to the higher lands. On Queen Charlotte Islands it is the prevailing conifer, attaining most magnificent proportions. Trees



Picea sitchensis: a, seed.

6 feet in diameter are common and larger trees up to 11 feet are frequently met with. An abnormal growth, probably caused by galls in youth and forming great excrescences, gives the trees so affected a most peculiar and picturesque appearance. This wood is almost exclusively used in the North, besides the Yellow Cedar, which comes next in importance. Western Red Cedar and Western

Hemlock also occur, but in more limited quantities. Douglas Fir is altogether absent. As the habitat of the Spruce is usually in the lower and more humid parts, few specimens are to be seen near Victoria. Although growing to a great size (one specimen I remember measuring 16 feet in diameter at the base), it does not carry its size like the Douglas Fir, and the branches, even when growing in dense forests, occur much nearer the ground than is the case with that tree. When growing in the open it is unquestionably one of the most stately of our conifers, the limbs, which are strong and rigid, starting out near the base, the ends touching the ground on all sides and diminishing regularly in length; so that the tree presents a perfect pyramid and forms a shelter through which no ordinary rain will penetrate. Although the growing tree exudes a great deal of gum, the wood, which is white, light, and pliable, is entirely free from resin and is extensively used in the construction of pleasure-boats, oars, fruit-boxes, etc. It has also been found a most desirable wood for aeroplane-building.

The branchlets and roots, which are very pliable, are used by the Indians in the construction of baskets and for other similar purposes. The leaves are short, about the same length as those of the Douglas Fir, and, like those of that tree, thickly set around the branchlets. They are of a dark bluish-green colour, very rigid and prickly. The branchlets, I should have mentioned, are characterized by extreme roughness caused by cork-like growths at the base of the leaves. The cones, which are of a light-buff colour, some 3 inches long, in clusters of three or four at the ends of the branchlets, have thin scales quite loosely put together, which open and shed the seed at maturity, about October. The cones themselves do not adhere to the tree for any length of time thereafter. The bark is thin, scaly, and of a reddish-brown colour; the round scales are continually shed, so that at the base of old trees the ground is covered several inches deep with them. The flowers, resembling large strawberries, are of a crimson colour and shed vast quantities of pollen in May.

ENGELMANN SPRUCE.

*Picea Engelmanni,** Engelm.

This tree, whilst resembling the Sitka Spruce in many respects, does not attain as great a size, 4 feet in diameter and 100 to 125 feet high being the limit. Its growth also is not of so spreading a nature, covering a much smaller space of ground; the tree therefore presents a stiff and ungainly appearance. The foliage is a sombre dark green, much resembling its Eastern congener, the White Spruce, in that respect. The leaves are shorter than those of our other Spruce, very rigid, but not so prickly, thickly set, in the young tree, all around the branchlets, but, as in the case of all conifers in the higher altitudes, inclined to crowd on the upper side in the older stages of growth.

The cones are also considerably smaller, seldom exceeding 2 inches in length, usually, in my experience, shorter. They are of a dark-brown colour, compact, and rigid. Like its congener, it loves wet and swampy localities, but does not restrict itself altogether to those conditions, as it is frequently to be found amongst other conifers in drier situations. Its range is all over the Interior Plateau, where congenial conditions exist, and on the mountains of the Coast at altitudes of 6,000 feet or thereabouts. The odour of this Spruce is pungent and not agreeable, and once experienced is not to be forgotten; it is thus a ready means of identification.

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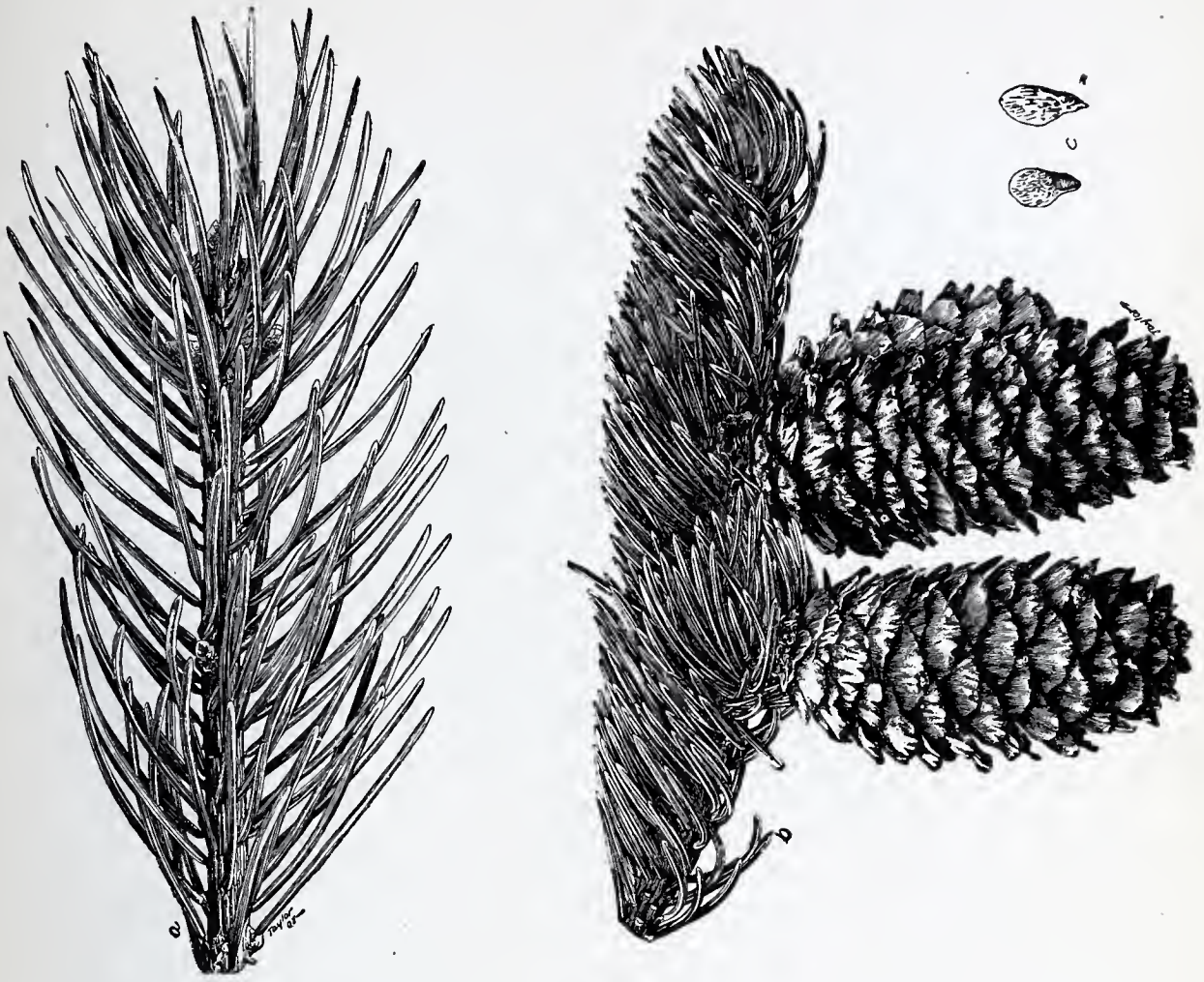
* *Engelmann's; after George Engelmann, an American botanist.*

Engelmann Spruce.



Picea Engelmanni: a, leader; *b,* side branch and open cone; *c,* seed.

WHITE SPRUCE.

*Picea canadensis,** Mill.

The White Spruce is found across Canada from the Atlantic Coast to the Yukon. In British Columbia it comes as far south as the Skeena, Babine Lake, Prince George, and Tete Jaune. The branches are long and curve downward and then upward, and have conspicuous small drooping branchlets. The foliage has a pale-bluish tinge inclining to white. The needles are stiff and short and placed around the twigs, but grouped together on the upper side near the ends. The cones are small and narrow with short, entire scales. When mature they are generally green tinged with red. The young shoots and leaves have when crushed a very unpleasant odour, which has earned for the tree the name of Cat-spruce. The pale-yellow wood is straight in the grain and soft. In consequence the White Spruce has in the East an excellent reputation as a timber tree. It reaches a height of 100 feet or even more, with a diameter of 3 or 4 feet.

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* *Canadian; because characteristic of Canadian forests.*

BLACK SPRUCE.

*Picea Mariana,** Mill.

The Black Spruce is also widely spread in Canada, but in British Columbia, while it covers much the same area as the White Spruce, it comes scarcely so far West. It is frequently found in marshy places and is with us a stunted tree, rarely more than 25 to 40 feet in height. The foliage is a dark blue-green tinged with white. One of the surest recognition marks is the permanency of the cones, which remain on the trees for years, so firmly are they attached. Its small size deprives it of commercial value except in districts where other wood is scarce, as in the mining districts of the North.

WESTERN LARCH; TAMARACK.

Larix occidentalis,† Nutt.

This tree does not occur to my knowledge to the westward of the Coast Range, nor in the northern part of the Province, but in the Upper Country it is common at certain altitudes, where in some parts large areas of fine trees are to be found. Through East Kootenay and along the Crow's Nest Railway very fine specimens are to be seen, whilst throughout the Okanagan and other parts, on the hillsides intermingled with other coniferous trees, this Larch is conspicuous. It is a straight-growing tree carrying its size to a great height; trees a foot through at the base, scarcely tapering to any appreciable extent for 60 to 80 feet, are frequent. The size of old trees runs from 3 to 4 feet in diameter, with a height of 100 or 150 feet or even more. The branches are small, and the lower ones dying off the trunk is left limbless, except at the top.

The bark of the young trees is smooth, of a greyish-brown colour and quite thin, whilst in the old trees it is distinctly red-brown, resembling that of *Pinus ponderosa* in that respect, and, like it, about the same thickness, some 2 inches, with deep scores running lengthwise, so that it is often difficult, judging from the bark alone, to distinguish one from the other. Here, however, the resemblance ceases, the Larch, as is well known, being a deciduous conifer. Its leaves, 1 inch or more in length, come out early in the spring in tassel-like clusters from little knobs on the branchlets, and turn to a dull yellow in the autumn, when they fall to the ground. While this tree when growing singly and covered with its tassels of light-green foliage is most beautiful, its peculiarity in shedding its leaves in winter makes it compare unfavourably with other conifers for ornamental purposes. The cones are quite small, about an inch in length, set quite close to the branch, with delicate hairy filaments projecting from between the scales. The flowers, also quite close to the stem, are a bright crimson.

A peculiarity of this tree is that two varieties of gum are exuded—namely, the ordinary resinous gum peculiar to all conifers, and a mucilaginous gum which exudes from wounds caused by fire, somewhat resembling gum arabic, but of a dark rich amber or brown colour, according to age. The natives esteem this gum very highly as a luxury for eating and also as an application for ulcerated sores. To obtain a supply the trees are slightly burned, so as to cause the exudation of the gum. Forest fires seldom injure the old trees, as the undergrowth where they occur is rarely heavy, so that the outside bark simply gets scorched. The specific gravity of the wood is greater than that of Douglas Fir and the colour is reddish. In the Kootenays, and in other parts where the tree occurs in quantity,

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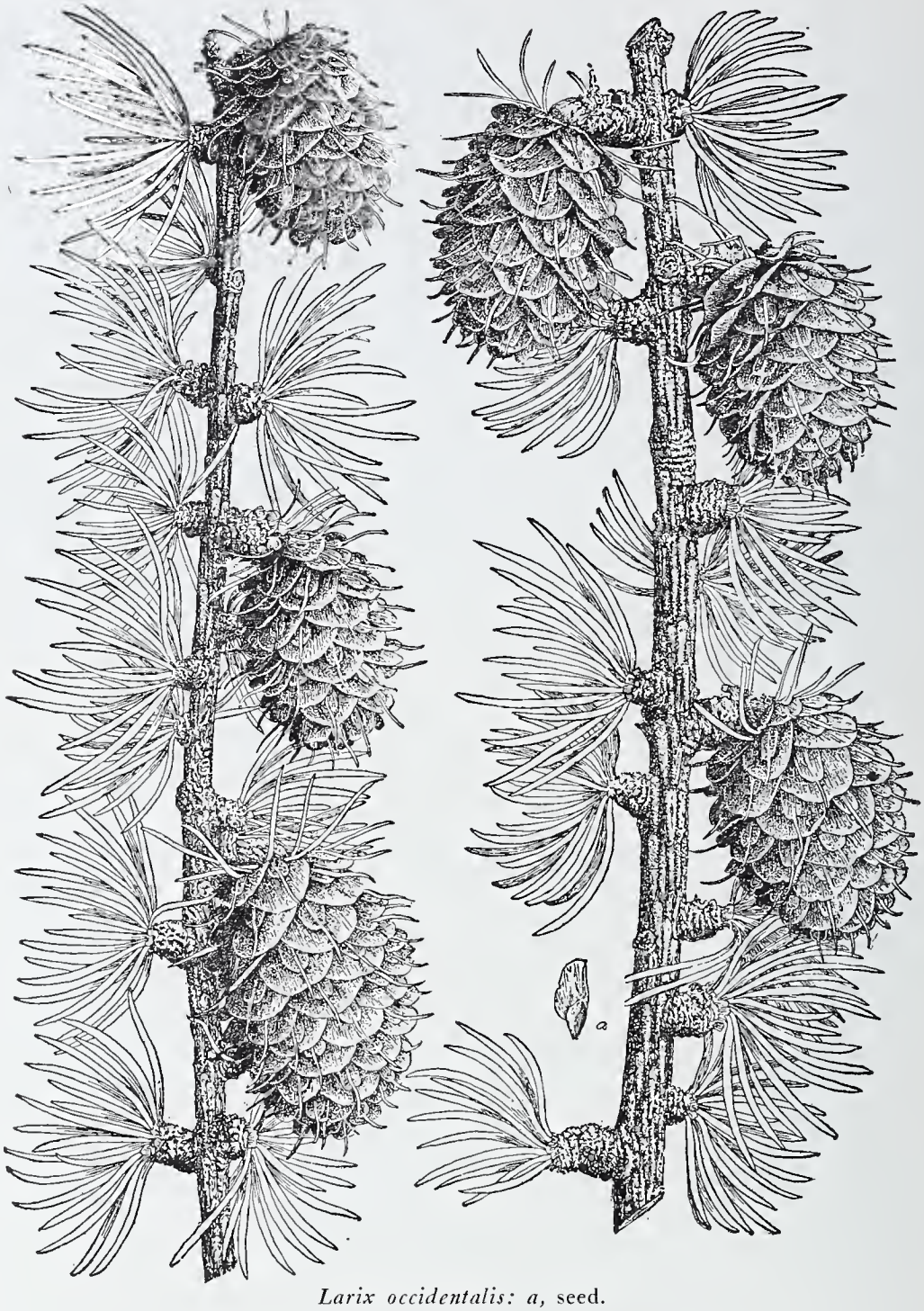
* *Origin unknown; a proper name.* † *Western.*

Western Larch, Cranbrook. Photo. Forestry Dept.

Trunk of Western Larch, Cranbrook.
Photo. Forestry Dept.

it is used commercially, manufactured into lumber for railway-ties and other purposes, and is greatly esteemed for its qualities. Amongst lumbermen "Tamarack" is the name it is altogether known by.



Larix occidentalis: a, seed.

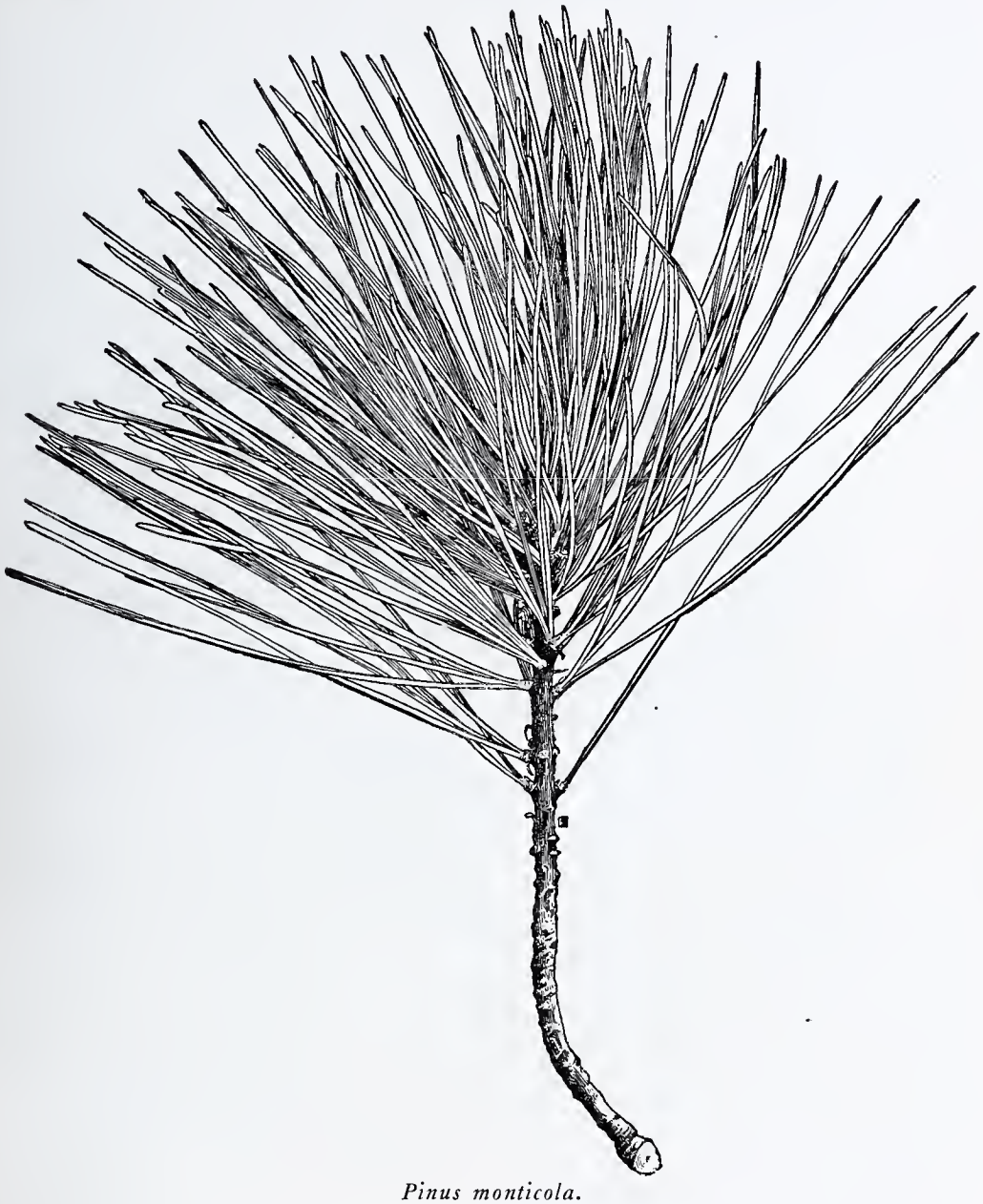
LYALL'S LARCH; ALPINE LARCH.

*Larix Lyallii,** Parlatore.

This is a much smaller tree than the other variety just described. I have found it only on the high parts of the Rocky Mountains, and in my experience

* *Lyall's; Dr. Lyall was an early collector on the Pacific Coast.*

I have not seen larger specimens than 30 to 50 feet high, and the greater number smaller. In general appearance the foliage resembles that of *L. occidentalis,* but of a duller and more bluish shade of green. The cones are about the same size and resemble those of the other species.



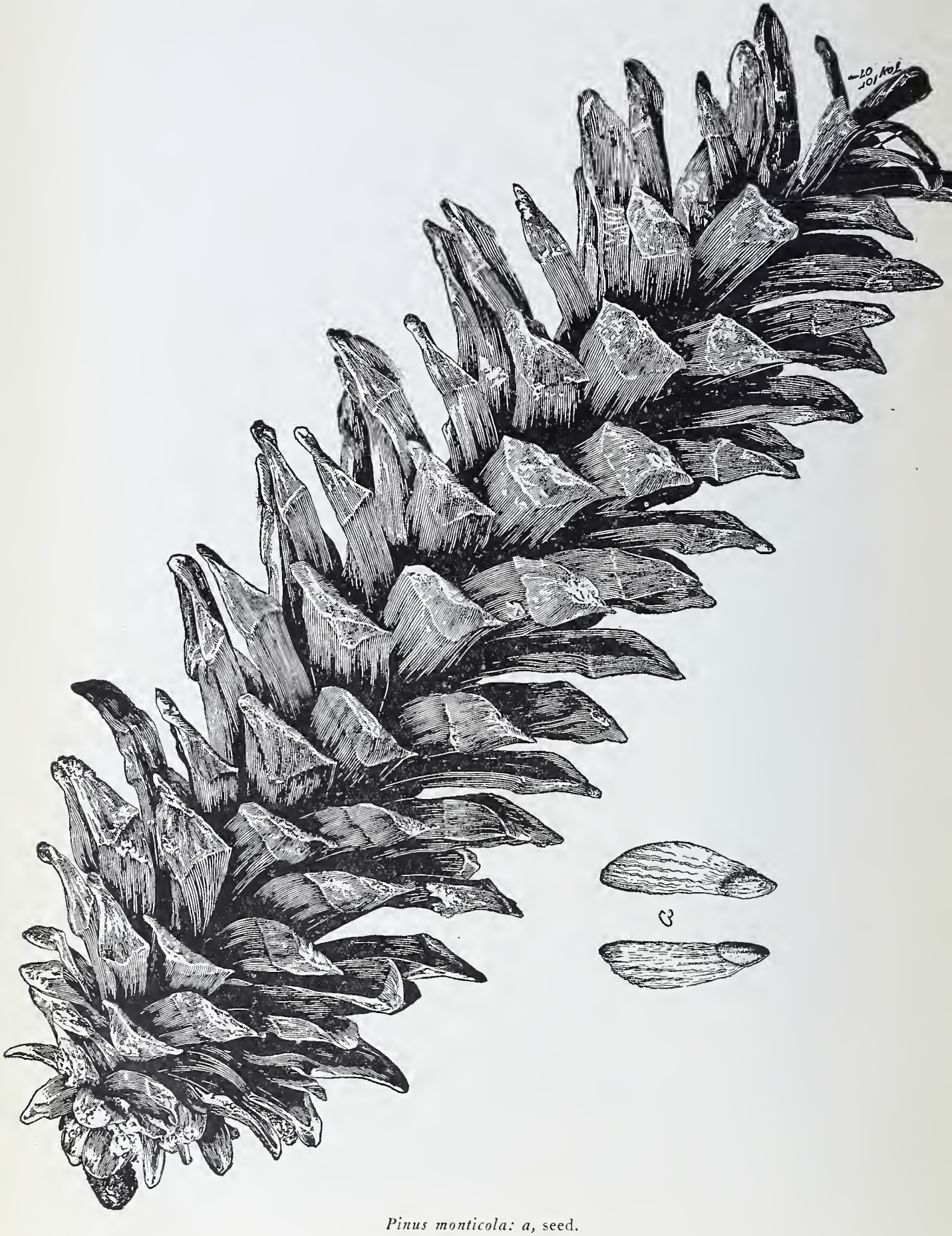
Pinus monticola.

WESTERN WHITE PINE.

*Pinus monticola,** Douglas.

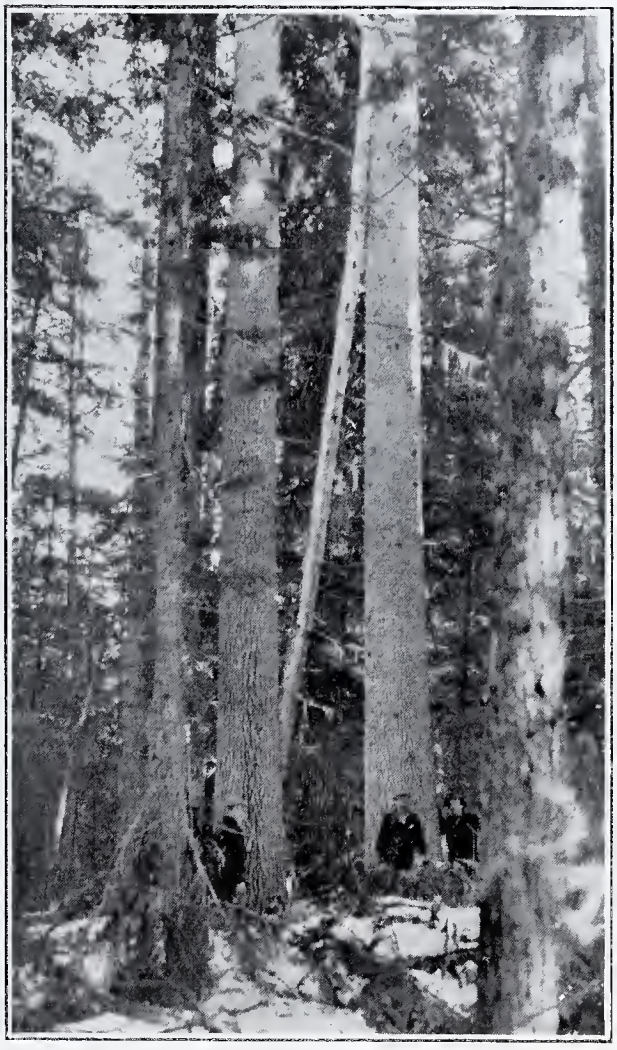
This, at once one of our noblest and most valuable trees, closely resembles its congener of the East, *P. strobus,* but has longer leaves and larger cones; there is, however, no material difference in the quality of the wood. While its range is very great throughout the Province, and the tree is therefore plentiful in the aggregate, it unfortunately does not occur in any very great quantity together, but intermingled with other forest trees, and for that reason is not as commer-

* *Mountain-dwelling.*



Pinus monticola: a, seed.

cially important as many others of less intrinsic value. It is found on the mountain-slopes of Vancouver Island and the Mainland Coast, as well as on those of the Interior where the rainfall is sufficient. A stately tree, 80 to 100 feet in height and from 2 to 4 feet in diameter at the base, it carries its size well up. Its leaves, in fives, 3 to 4 inches long, of a bluish-green colour, are a distinguishing character. The cones are also very characteristic, from 8 to 12 inches in length, and borne in an upright position near the tops of the trees and at the ends of the branches. When immature they are of a greenish-grey colour, and greyish-brown when ripe, after which they soon fall to the ground. The



Western White Pine, Rosebud Lake.
Photo. Forestry Dept.

bark in young trees is greyish-brown in colour, turning darker and splitting into peculiar square plates in the older individuals, resembling the Western Hemlock in the appearance of the trunk in that respect. The bark never becomes very rough or thick, being only from 1 to 2 inches in thickness.

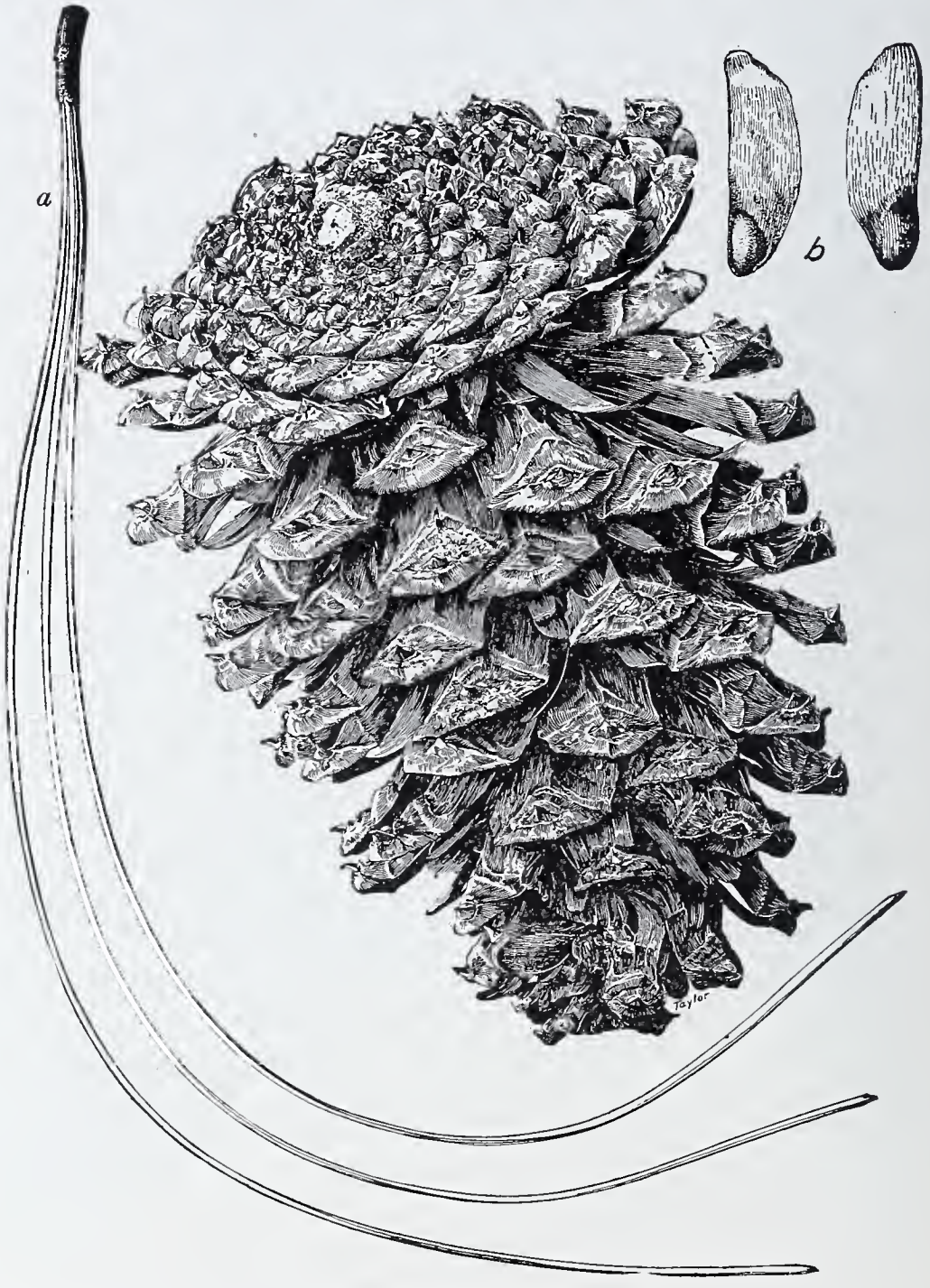
The wood is white, soft, and easily worked, and has the same peculiar and not unpleasant odour of the Eastern White Pine, the "King of Woods," as it is justly called. The peculiar bluish-green leaves and the long cones referred to are characteristics by which this tree can be easily identified. These characters and the beauty of the tree generally entitle it to a place in all arboretums.

WESTERN YELLOW PINE.

*Pinus ponderosa,** Douglas.

This tree is often locally called Bull-pine, a name that is applied to other members of this family. The range of *P. ponderosa* is confined to the plateau between the Rocky Mountains and the Selkirks, and between the latter and the Coast Range, its habitat being essentially those portions of the Province where the precipitation is limited. In some places it is found in large quantities in the

* *Ponderous; referring to the heavy foliage and large cones.*



Pinus ponderosa: a, leaf; *b,* seed.

valleys and extending some little distance up the mountain-sides, but never in dense forests like the Douglas Fir and other conifers.

This, too, while not as beautiful as some others, is possibly the most picturesque of our conifers, presenting with its characteristic foliage quite a tropical appearance. Its size varies in mature individuals, from 2 to 4 feet in diameter and from 80 to 100 feet in height. Growing singly, the branches begin close to the ground, extending 15 to 20 feet and forming a regular compact head, while in groves it has a trunk devoid of branches for a distance of 40 to 60 feet. The bark of the young tree is of a dark-brown colour, lightly scored, but in mature

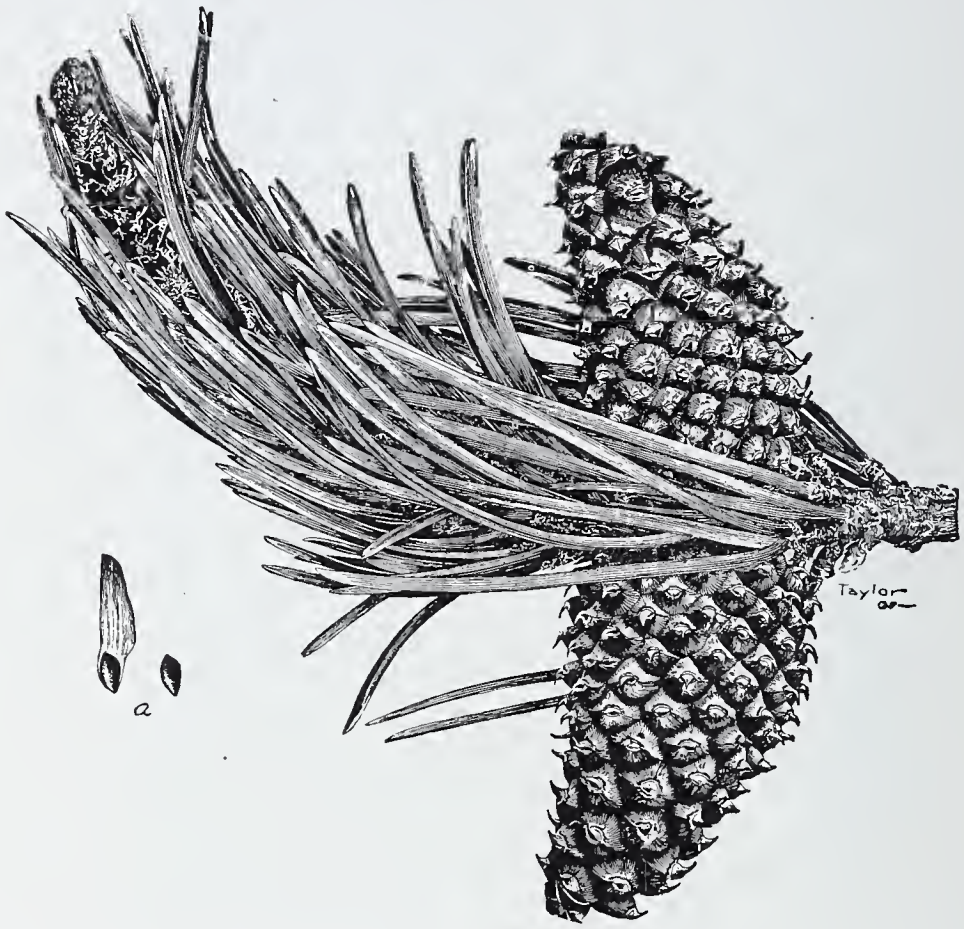
Western Yellow Pine, Vernon F.D. Photo. Forestry Dept.

specimens the bark is a cinnamon-red with deep scores, running longitudinally, with an ordinary thickness of 2 to 3 inches, seldom much more.

The leaves, 6 to 9 inches long, are in threes, borne in dense masses at the ends of the branchlets, and of a fine bright-green colour. The cones are conspicuously different from those of any other of our conifers. They are large, 4 to 5 inches long and 3 inches, often more, in thickness when mature. In the immature state they are not nearly so thick, but very compact, with conspicuous sharp knobs, and are then of an olive-green colour, usually well covered with gum. The cones are borne in clusters of twos, threes, and even fours, very close

to the stems near the ends of the branchlets, with a dense tassel of long leaves ornamenting the extreme tip. The seeds are quite large and are provided with prominent wings which at maturity (about the end of August) are easily shaken out, and as they form an article of diet amongst the natives they are then collected for winter use. In taste they are like a filbert or hazel nut and resemble the pine-nuts of California. The odour of the branches when cut or bruised is very agreeable, resembling that of the orange.

The mature tree also exhales an odour which pervades the whole atmosphere where it occurs in quantities. Commercially the wood is of no great value, as it is lacking in strength and therefore unfit for heavy work. It decays very quickly when exposed to the weather. It is, however, quite extensively used, in places where other and better woods are not easily obtained, for inside work, for apple-boxes, and for rustic work.



Pinus contorta: *a*, seed with and without wing.

SCRUB PINE; LODGEPOLE PINE.

*Pinus contorta,** Douglas.

Personally, I have always been of the opinion that this tree is identical with *P. Murrayana,* and this opinion is concurred in by no less an authority than Professor C. S. Sargent, of the Arnold Arboretum, Harvard University, who says: "It seems to me that *Pinus Murrayana* must be considered as a variety

* *Contorted, or crooked; descriptive of its gnarled growth.*

of *P. contorta,* the two forms intergrading in a perfectly hopeless manner." Near the sea-coast on exposed points it is of gnarled and stunted growth, whilst in more favourable situations and growing in dense groves it assumes the growth and appearance of what is known as *P. Murrayana,* which is its designation when occurring in the low mountains of the Mainland Interior. There it grows in dense forests, straight, tall, and limbless, except at the top, seldom over a foot in diameter and from 60 to 100 feet in length. The same tree on lower lands in poor gravelly soils and exposed situations has all the characteristics of the Coast

Lodgepole Pine, Spahomine Creek, Vernon F.D.; diameter 30 inches, height 75 feet. Photo. Forestry Dept.

tree. Environment and conditions are therefore, in my opinion, altogether responsible for the apparent differences which have caused so much discussion amongst botanists and specialists with reference to this species.

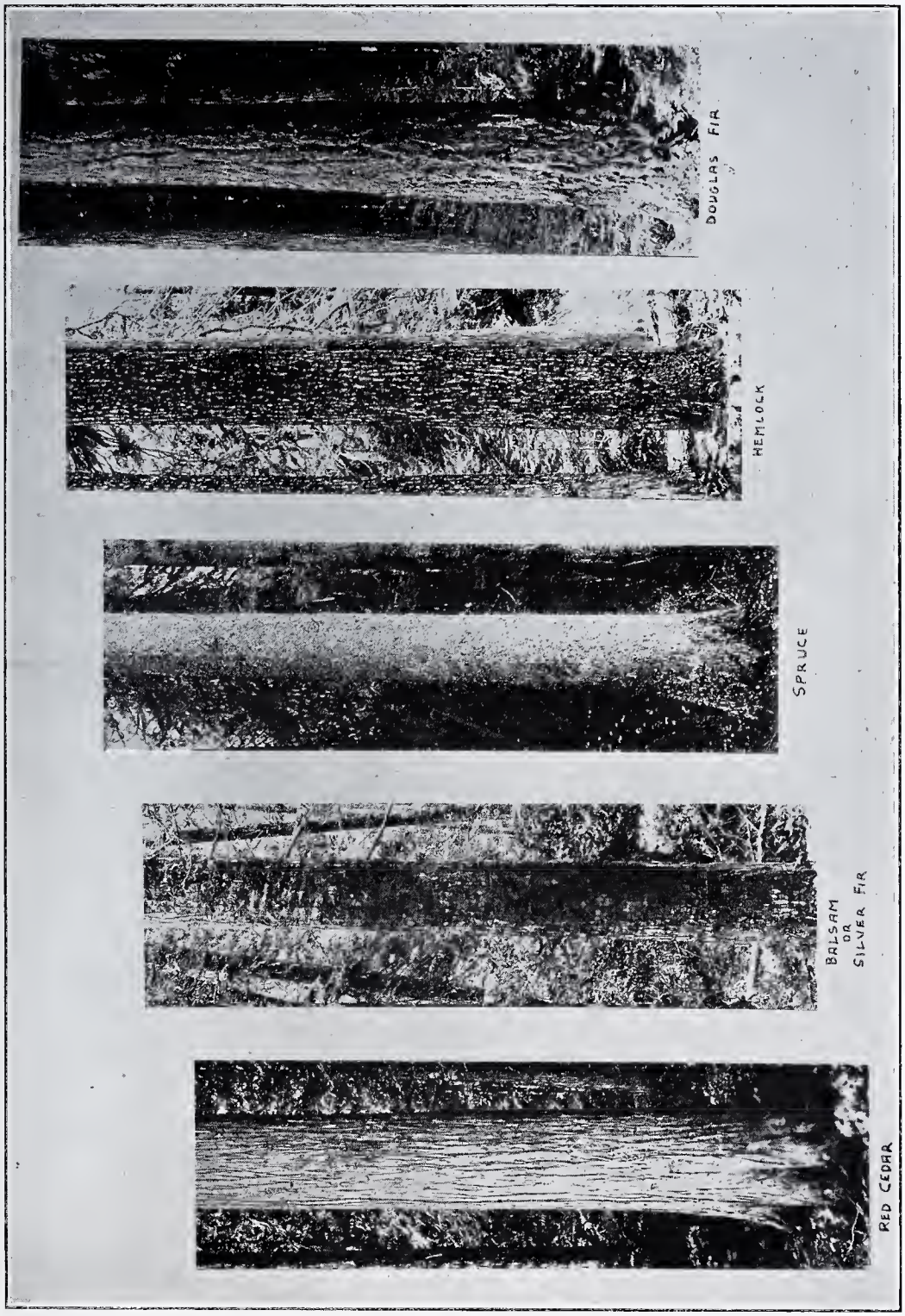
The range of this tree is very great, occurring as it does pretty well all over the Province, and the habitat very varied, growing in swamps, exposed rocky points, sand-dunes, dry gravelly wastes, mountain-tops, and low delta lands. It is not usually intermixed with other trees to any extent, but is generally found either in groves or growing singly. It never grows to a large size anywhere,

18 inches to 2 feet in diameter being exceptional and 6 to 10 inches being much more common. On account of its rigid form, the stiff branches pointing distinctly upward, it is by no means a handsome tree, even under the most favourable conditions. The leaves, in twos, are about 2 inches, seldom more, in length and are of a sombre dark-green colour. The cones are very characteristic, being from 1 to 2 inches in length, about an inch at the base, and tapering to a point. They adhere closely to the branches, usually in couples, are very hard, and are covered with sharp spiny scales, which sometimes remain closed over several seasons. The cones themselves remain adherent to the branches also for several years, generally escaping the ravages of fire, and thus being able to reafforest burnt-over

Pinus contorta.

areas very quickly. The bark, of a greyish-brown colour even on young trees, is rough, and on old trees scored and broken by ridges, out of which gum exudes. It forms into round hard globules which the natives collect and chew.

The sap, which is sweet and of an orange flavour, is also used by natives as a delicacy. The method of collecting the sap is as follows: The bark is stripped from the trunk in the spring-time, and the sap underlying it on the trunk is taken off in ribbon-like strips by means of a bone implement. The wood is not of commercial value, except in the mining camps, where it is very useful for timbering tunnels and for constructing log buildings. It is white in colour, streaked with a darker shade, and frequently quite gummy.



Thuja gigantea. *Abies amabilis.* *Picea sitchensis.* *Tsuga heterophylla.* *Pseudotsuga Douglasii.*

BLACK PINE.

*Pinus Murrayana,** Balfour.

This species is without reasonable doubt identical with *Pinus contorta;* the description, therefore, given of that tree will answer for this now under review. Since writing the above I have been placed in receipt of "Forest Trees of the Pacific Slope," by Geo. B. Sudworth, Dendrologist of the United States Department of Agriculture, who agrees with the opinion given. He says: "The Pine described under this name is one of the most interesting of Pacific species on account of its variable character, and on account of its enormously wide range, which extends from sea-level to nearly 1,000 feet elevation. For many years a fruitless effort has been made to keep the tree, which inhabits the Northern Pacific Coast region extending to Alaska and eastward over the Western Cascades, and known as *Pinus contorta,* distinct from the tree of the high Sierras and Rocky Mountains plateau, known as Lodgepole Pine (*Pinus Murrayana* and *P. contorta Murrayana*). The distinctions assembled to separate these trees are one after another broken down when the trees are carefully studied throughout their great range. Difference in thickness of bark, size of cones and leaves, or size and form of the tree are not too great to be consistently merged into one polymorphous species as it is proposed to do here.

"The reproductive organs of these supposedly distinct trees are essentially the same. With no characters found in these organs to warrant a distinction of species, the other so-called distinctions depended upon are believed to be unworthy of serious consideration. Perhaps no other North American trees have given so much trouble, or left so much uncertainty in the minds of those who have attempted to hold them separate. Recent students of trees have been slow to depart from the time-honoured judgment of earlier writers. It is confidently believed, however, that those writers would have taken the broader view had they been able to study the trees as they grow in all their 'retreats.'"

LIMBER PINE; ROCKY MOUNTAIN PINE.

Pinus flexilis,† James.

This tree and the following, *P. albicaulis,* are both found in the Rockies, Selkirks, and other ranges of the Mainland. The points of resemblance are such as to be somewhat confusing, but they are undoubtedly distinct varieties. *P. flexilis* has a range of considerable extent along the shores of the Arrow and Kootenay Lakes, besides being found on most of the other lower mountain ranges, but it does not occur, as far as known, on the Islands. It has many points of resemblance to *P. monticola,* but it does not grow to such a size, nor are the leaves and cones so long.

The usual size is from 18 to 24 inches at the base, with a height of from 50 to 80 feet, on the lower lands, and much smaller at greater altitudes. When it occurs singly it presents a very symmetrical appearance, the branches growing in very regular whorls, gradually lessening in their extent, until a perfect cone is the result. Such trees are to be seen in the vicinity of Nelson and along the lake-shores thereabouts. The bark is of a dark-brown colour, about 1½ inches thick, rough, and seamed with scores, out of which the gum exudes in quantities. The leaves are in fives, 2 to 3 inches long, covering the branches very thickly,

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* *Murray's; after Andrew Murray, a Scottish botanist.*

† *Pliable; referring to its long and slender branches.*

and of a dark-green colour. The cones, usually in pairs, are from 4 to 8 inches long by 2 inches in diameter, with wide pointed scales usually decorated with a drop of gum at the tips. They fall to the ground very soon after maturity. The seed is quite large, about the size of a sweet pea, and wingless. The wood is white and where well grown makes excellent lumber.

Pinus flexilis: a, cone scale and seed.

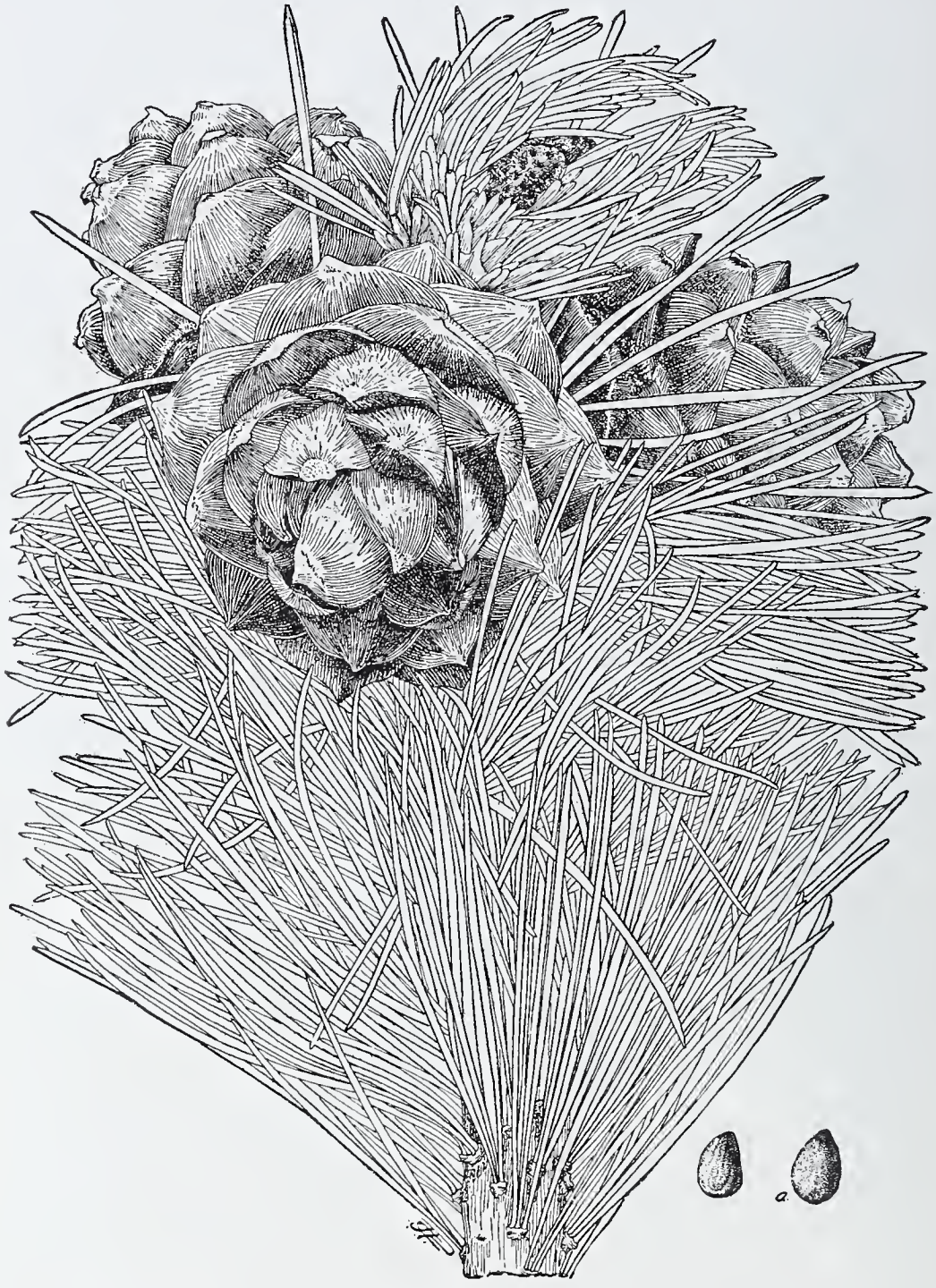
WHITE-BARK PINE.

*Pinus albicaulis,** Engelm.

This tree closely resembles its congener, *P. flexilis,* and, as mentioned under that head, is somewhat difficult to separate from it. It also occurs on the mountain ranges of the Interior, but usually at a greater altitude than the other, probably not lower than 6,000 feet. It does not, from my observation, attain any great size, only about 50 feet high, and often in a gnarled shrubby form.

* *White-stemmed.*

The bark, as the name suggests, is distinctly white, especially on the younger trees. The leaves are also in fives and resemble those of *P. flexilis* in their growth, about the same length but somewhat more slender, and the colour is light green. The cones are short, about 2 to 3 inches, bearing wingless seeds, smaller than those of the other species. Occurring as it does on high mountains and in no great quantities, it naturally cannot be accounted of any commercial value.



Pinus albicaulis: a, seed.

WESTERN YEW.

*Taxus brevifolia,** Nutt.

It is a small tree, occasionally attaining a size of 2 feet in diameter and 30 to 40 feet in height, but usually smaller. Its habitat is principally along the sea-coast of the Province, generally in thickets with other trees. The leaves are short, as the name denotes, about 1 inch, flat, thin, and placed regularly on each side of the branchlet, like those of the Hemlock. The fruit is a pretty red berry about the size of a pea, somewhat flattened, with a peculiar hollow at the

* *Short-leaved.*

Taxus brevifolia: a, fruit, lower side.

calyx. The bark is smooth and of a dark red-brown colour, usually very much broken up by tufts of offshoots, which appear all over the trunks. The wood is very dense and hard, of great specific gravity, and of a fine red colour. It takes a high polish and is useful for inlaying and ornamental work.

Like our own forefathers, the natives were well aware of the suitability of yew-wood for bows, and, when they were in use, utilized it for that purpose whenever obtainable, as well as for various other purposes where great strength was wanted, as in the case of their peculiar halibut-hook, paddles, etc.

RANUNCULACEÆ.

WHITE CLEMATIS; OLD MAN'S BEARD.

*Clematis ligusticifolia,** Nutt.

This climber is common throughout the Upper Country along watercourses, growing to a considerable length and often covering the neighbouring shrubs and trees. The leaves are from 1 to 3 inches long, sometimes divided into two or three lobes, coarsely toothed, and of a bright-green colour. The flowers are white, not more than half an inch across, and occur in panicles. The seed has long grey or white silken threads attached, which give the plant a very attractive appearance after the flowering period, and to which is due the common name of "Old Man's Beard."

BLUE CLEMATIS.

Clematis verticillaris† var. *Columbiana,*‡ Gray.

This is not so common as *C. ligusticifolia,* but occurs generally through the Upper Country amongst other shrubs. The leaves are in threes at the ends of the slender leaf-stems, 1 to 2 inches long and half as wide, slightly cordate, and quite sharp-pointed or acuminate.

The flowers are large and showy, 2½ inches or more across, and of a beautiful violet-blue. The seed also has the characteristic silken threads of this genus, but not as conspicuous as the other.

BERBERIDACEÆ.

OREGON GRAPE; BARBERRY.

Berberis aquifolium,§ Pursh.

A handsome evergreen shrub from 1 to 15 feet high, the latter height when growing in thickets with other plants and in favourable localities. Its leaves can best be described as resembling those of the English Holly, being a shiny

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* *Leaved like Ligusticum or Lovage; i.e., with thrice divided compound leaves.*

† *Whorled; in circles about the stem.*

‡ *Columbian; i.e., belonging to (British) Columbia, where it is principally found.*

§ *The specific name of the common Holly; used here to denote the similarity of the leaves.*

green with the same characteristic spines, but not so crinkled; those in exposed situations often turn red in winter. Their size is from 1 to 3 inches long and the shape oblong. The flowers, borne at the ends of the branchlets in clusters, are bright yellow with an agreeable odour.

The fruit varies in size from that of a small to a very large pea, oblong in shape, purplish-blue covered with a light bloom, and containing a large seed. It is intensely acid until touched by frost and makes a fine jelly. The range is pretty well all over the Province, and the habitat, dry rocky hillsides, open woods, and thickets.

LOW BARBERRY; SMALL OREGON GRAPE.

*Berberis nervosa,** Pursh.

This is also an evergreen, closely resembling the last in the shape of its leaves and fruit. This shrub, however, seldom exceeds 18 inches in height, the flower-stems starting out from near the ground. The flowers, in racemes, are of a light-straw colour, with a reddish tinge on the outside of the petals and very sweet-scented. The fruit, which it bears profusely, is to all intents and purposes the same as that of the last, only rounder in shape. Its range is all over the Islands and Mainland to the westward of the Coast Range and its habitat deep fir forests.

CREEPING BARBERRY.

Berberis repens,† Lindl.

This shrub resembles both the others in some respects. It does not grow as high as *B. aquifolium,* but is larger than *B. nervosa.* The leaves are smaller and also more rounding; the spines less prominent and the colour not such a bright green. It is sometimes tinged with a slight reddish-brown on the upper sides and is light green on the lower.

The flowers, yellow, are borne in short racemes at the ends of the branchlets. The fruit is blue and covered with a bloom. Its range is confined to the upper Mainland on dry stony ridges.

CELASTRACEÆ.

WILD BOX.

Pachistima myrsinites,‡ Raf.

I call this evergreen shrub "Wild Box," as it closely resembles the cultivated Box. It grows from 1 to 4 feet high in dense masses. The leaves, borne very profusely all along the branches and of a shiny green, are from ½ to 1 inch long, finely serrated at the edges; the flowers, very small and of a brick-red colour, appear very early in the spring, and are borne in small clusters in the axils of the leaves.

Its range is all over the Province and its favourite habitat dry sandy or gravelly ridges. This is the only representative to my knowledge of the natural order Celastraceæ in this Province.

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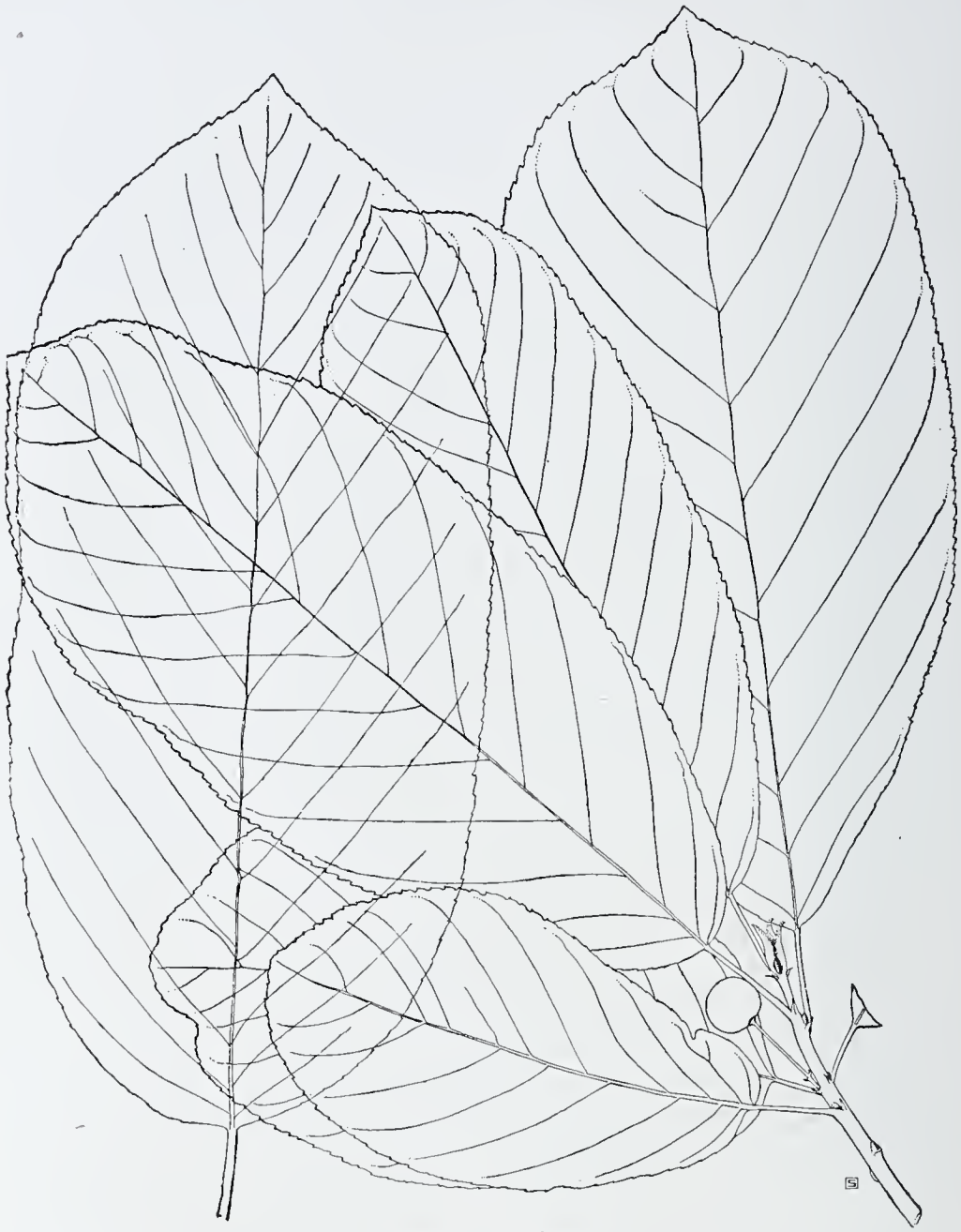
* *Nerved; referring to the palmate veining or "nerving" of the leaves.*
† *Creeping.* ‡ *Myrtle; referring to the evergreen leaves.*

RHAMNACEÆ.

BUCKTHORN.

*Rhamnus Purshiana,** DC.

This tree, sometimes called Bearberry, and from that often wrongly called Barberry, is not uncommon on the Islands of Vancouver and the Gulf and on



Rhamnus Purshiana.

the Coast of the Mainland, where it often attains a diameter of a foot or more and a height of 15 to 40 feet. The wood is of a light-yellow colour, close-grained and hard, but not used commercially, except for ornamental purposes.

* *Pursh's; after Fred T. Pursh, a German botanist.*

The bark, which is smooth and of a whitish-grey colour, is the medicinal *Cascara sagrada* of commerce and has been collected in large quantites in the adjoining States, where, on account of the wasteful methods practised, the tree is fast disappearing. It is collected to a limited extent in this Province.

The flowers, small and inconspicuous and of a greenish colour, are borne in the axils of the leaves on short stems near the ends of the branches. The fruit is about the size of an ordinary pea, black when ripe, with two or three seeds. These berries, as the vernacular name indicates, are much liked by bears and also by wild pigeons. The leaves are a beautiful dark glossy green, minutely toothed, from 4 to 6 inches long and 2 inches wide, terminating in a blunt point. Very young trees are often semi-evergreen, the leaves remaining on all winter.

CRIMSON-TWIGGED RED ROOT.

*Ceanothus sanguineus,** Pursh.

This is a shrub belonging to the natural order of the Buckthorn family and sometimes called "Buck-brush," one variety of which, *C. americanus,* is called New Jersey Tea. Our plant grows from 6 to 12 feet high. The young branches are of a reddish colour; hence the specific name. The leaves resemble those of the cultivated plum when looked at casually. They are from 2 to 3 inches long and slightly narrower, so that they are nearly round, and are serrated. The flowers, quite small, are yellowish-white in colour, and borne along the ends of the branches in long bunches rather than racemes. Its range is all over the southern parts of the Island and Mainland and its habitat dry gravelly soils. It is a handsome shrub for cultivation.

SMOOTH MOUNTAIN BALM.

Ceanothus lævigatus,† Hook.

It is a shrub from 4 to 10 feet high. The stems when young are green and very rigid. The evergreen leaves, from 2 to 3 inches long and from 1 to 2 inches wide, are of an oval shape, roundly pointed, and very finely serrated. They are peculiar in that, besides having the usual midrib, they have two others clearly defined. They give out a strong aromatic odour from a shiny gummy substance which covers the leaves, giving them the appearance of being varnished on the upper sides. The colour is a vivid green. The flowers, small and yellowish-white, are borne in branches or panicles on long stems which start from the axils of the leaves near the ends of the branches. It occurs rather rarely on Vancouver Island and in great quantities in some of the more southerly sections of the Upper Country, but not on the Lower Mainland, as far as I have observed. Its habitat is open dry woods or bare rocky situations. When occurring in quantities it is a most objectionable shrub to force one's way through, for, besides the gummy substance I have alluded to, it is very rigid and grows in dense masses.

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* *Blood-red; the colour of the young twigs.*

† *Smooth; the leaves are smooth or hairless beneath in this species.*

SAPINDACEÆ.

BROAD-LEAF MAPLE.

*Acer macrophyllum,** Pursh.

This tree is so named on account of the extraordinary size of its leaves. One authenticated specimen which I collected measured 16½ inches from the point at which the stem joins the leaf and 21½ inches across, and I have since seen larger specimens. The leaves turn to a golden-yellow in the autumn. The flowers, which appear about the first of April, before the leaves, are of a light-straw colour in crowded pendant racemes; they are cup-shaped with numerous anthers which stand prominently above the petals, and are borne all along the

Broad-leaf Maple, Duncan, V.I.; spread of branches 75 feet diameter.
Photo. F. A. Monk.

ends of the branchlets. The seeds, which are produced in great quantities, are in couples, each enclosed in a hard case about the size of a large pea and thickly covered with coarse bristly hair. The cases are provided with wings about 2 inches in length which carry the seeds long distances, and since the latter germinate very readily the surrounding land is usually thickly covered with seedlings the following spring. It grows to a large size, the trunks frequently attaining a diameter of 3 and 4 feet, and, when growing close together or with other trees, very straight and tall. When growing singly in the open it forms a magnificent shade-tree: one remarkable specimen near Victoria covers a space of about 80 feet in diameter; other specimens at Alberni cover spaces of 60 feet and over.

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* *Large-leaved.*

Acer macrophyllum.

This is probably the commonest and best of this class of our hardwoods. It is close-grained, takes a fine polish, and is well adapted for furniture, inside finishing, and carriage-building. That part which by reason of its abnormal growth is known as " Bird's-eye Maple " is very beautiful. The natives where

Broad-leaf Maples. Photo. Edgar Fleming.

this wood occurs use it to a considerable extent for paddles and articles of domestic utility. Its range is all over the lower lands of Vancouver Island, the Gulf Islands, and the Mainland to the westward of the Coast Range. Its favourite habitat is low rich bottoms, but it also occurs on higher lands, but at no great altitudes.

DWARF MAPLE; SMOOTH MAPLE.

*Acer glabrum,** Torrey.

This Maple, often erroneously called Vine-maple, frequently attains the dignity of a small tree 20 to 30 feet high and 6 to 9 inches in diameter on Vancouver Island and the Lower Mainland, but beyond the Coast Range it

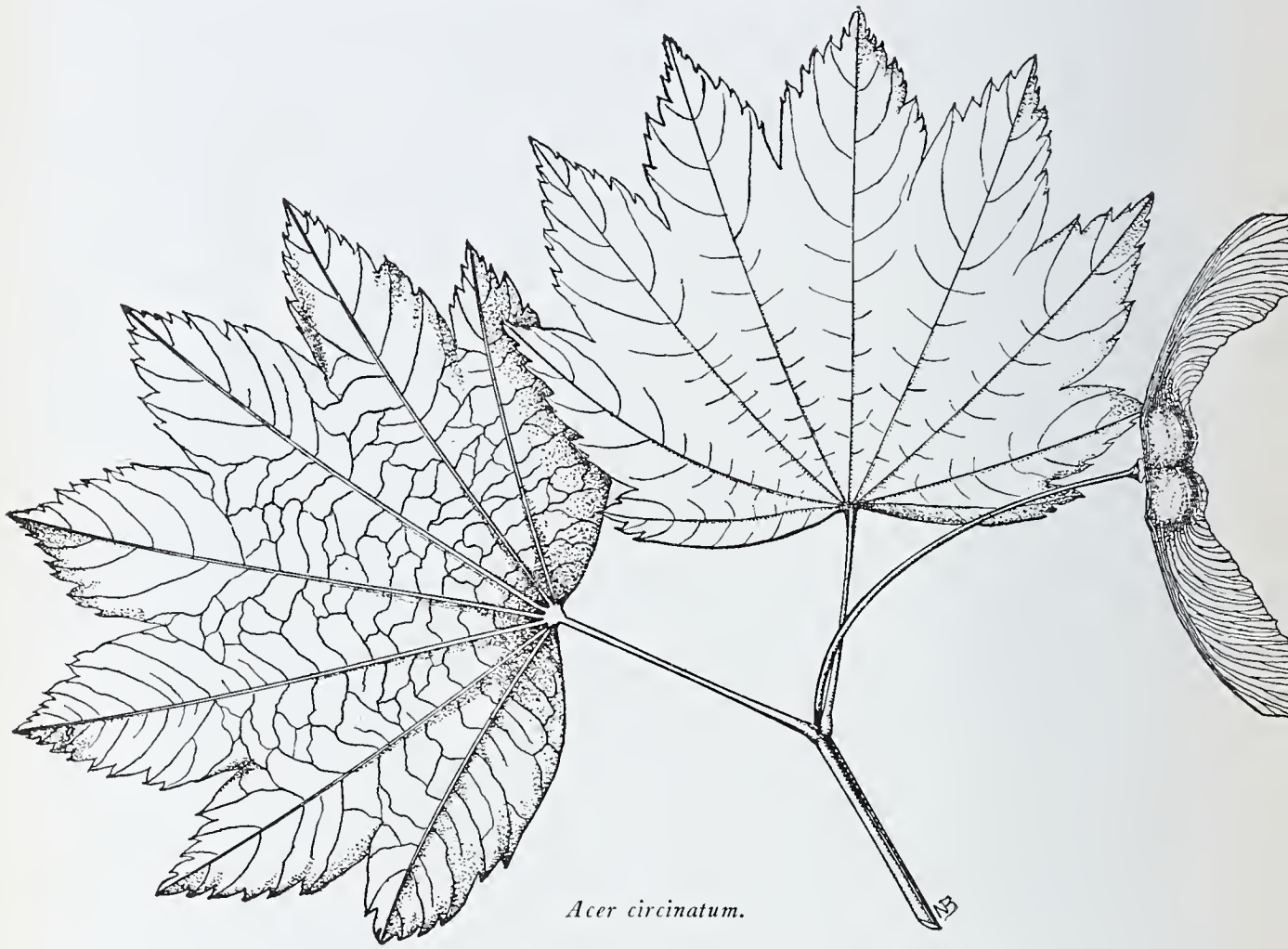
Acer glabrum.

never grows to a larger size than a fair-sized bush. The bark is smooth, even on old trees, and of a greyish-brown colour; the newly grown branchlets are red in winter. The leaves, from 2 to 4 inches across, are five-pointed, bright green,

* *Smooth.*

turning to a dull red in the autumn, sometimes striped with yellow. Frequently the leaves of this Maple turn a brilliant crimson in summer, beginning at the tips and gradually extending over the leaf, presenting a most beautiful appearance; this phenomenon is caused by an insect. The flowers are a greenish-yellow, ¼ to ⅜ inch across, with about ten narrow petals. These appear in bunches of four to six on stems about ⅞ inch long, which are borne along the branchlets near the ends in the axils of the leaf-buds, opening on the Islands about the end of March or the first week in April. The seeds, in twos, with short wings, are borne very plentifully and thickly on the small trees, or rather shrubs, in the Interior, but quite sparsely on the larger trees of the Coast.

It is a very ornamental tree, making a fine shade, and since it does not grow to a large size is well adapted for small grounds. The range is pretty well all over the Province in all kinds of situations, except on wet land.



Acer circinatum.

VINE MAPLE.

*Acer circinatum,** Pursh.

This tree, as its name indicates, grows much in the shape of a vine, gnarled and crooked. Its range is confined to the Mainland, to the westward of the Coast Range, usually in deep shade, where on account of its slender growth it bends down with either its own weight or that of rain and snow, often taking

* *Coiled; referring to its habit of growth.*

root at points of contact with the damp soil and thus forming dense impenetrable thickets. It is not found on Vancouver and Gulf Islands, nor to the eastward of the Coast Range on the Mainland. Its height is hard to estimate on account of its peculiar growth, say from 10 to 20 feet, seldom exceeding 8 inches in diameter at the butt. It furnishes a most useful wood to the settler, as, being hard and tough, it makes excellent wagon-tongues, handles for implements, ox-bows, etc. The natives make use of it for many household utensils, such as spoons, dishes, etc. The bark is smooth and of a light-green colour, often covered in young trees with a whitish bloom. The flowers, which occur in loose corymbs of ten to fifteen, are deep red or maroon with yellow anthers and are all borne at the end of the branchlets. The seeds are in twos, with the wings spread nearly at right angles to the stems.

ANACARDIACEÆ.

SMOOTH SUMACH.

*Rhus glabra,** Linn.

This Sumach is a shrub from 2 to 8 feet high, whose habitat is the dry sandy soils of the Upper Country, where it is usually found along streams and coulees, but often on hillsides. It has what are known as compound leaves; that is, several borne on one leaf-stem as in the Walnut. The leaflets are lanceolate and pointed, from 2 to 4 inches long, and serrated. When young they are of a reddish-brown colour, later turning to a dull green, and to a bright red in the autumn. The flowers are a dull greenish colour found in bunches at the ends of the branches, and the fruit is red.

POISON-OAK.

Rhus diversiloba,† T. & G.

This is a shrub usually from 3 to 5 feet high, and sometimes reputed to attain a much greater length when climbing on the trunks of trees. The leaves are mostly trifoliate, sometimes only shallowly divided into several rounded lobes, but by no means constant in this habit, many of the leaves being whole and rounded and others only partly divided. The flowers are minute, greenish-white, in racemes starting irregularly along the stems, usually from the axils of the leaves.

Poison-oak is said throw off a volatile oil, intensely poisonous to some people, even without actual contact with the plant, causing distressing swelling of the hands and face, whilst others are quite immune. The range is quite extensive on the Mainland, but limited on the Islands. The habitat is dry rocky hillsides.

POISON-IVY.

Rhus toxicodendron,‡ Linnaeus.

Poison-ivy is a small partly climbing shrub sometimes erect. The leaves are trifoliate and slightly pubescent, the flowers in panicles small and inconspicuous, and the fruit white and smooth. The natural habitat is by streams and in

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* *Smooth; from the smooth or hairless under-side of the leaves.*

† *Unlike-lobed; referring to the irregularity of the leaves.*

‡ *Poison-tree; descriptive of its poisonous properties.*

thickets. It does not occur on Vancouver Island to my knowledge, but is common in parts of the Mainland. I have collected it at Salmon Arm. Its reputation as a poisonous plant is equal to that of the Poison-oak and it affects people in the same manner.

Prunus emarginata.

ROSACEÆ.

BITTER CHERRY.

*Prunus emarginata,** Walp.

The range of this tree is principally on Vancouver and Gulf Islands and the Lower Mainland, although smaller specimens occur in parts of the Upper Mainland. In the first-named sections it ordinarily attains a size of from 6 to 12

* *Notched at the apex; the lobes of the calyx are often so notched.*

inches in diameter at the butt and from 40 to 50 feet high. Its habitat is usually amongst other trees in dry situations, rocky ground, etc. The bark, of a reddish-brown colour, was used by the natives for fastening the feathers to their arrows when they used those weapons for shooting aquatic animals, as water does not affect it as it does sinew, which was ordinarily used. They also used it in the ornamental parts of basket-work, mats, etc.

The leaves are about 2 inches in length and 1 inch wide, bluntly pointed and finely serrated, with the characteristic odour of prussic acid or bitter almonds. The fragrant flowers are white and borne numerously along the ends of the branchlets, in some cases, particularly on the Upper Mainland, covering the branch from its tip for a distance of 12 to 18 inches. The fruit is small, about the size of a pea, of a brilliant red, and intensely bitter, so that it is quite unfit for use. Altogether this tree, whether covered with white blossoms or red fruit, is very handsome and deserving of a place in ornamental grounds.

RED CHERRY.

*Prunus pennsylvanica,** Linn.

The Red Cherry resembles in a general way the Bitter Cherry, but the leaves are long-pointed and the calyx lobes are not emarginate. It differs also in the flavour of its fruit. I have found it at Nelson, in the Kootenays, and it no doubt occurs in other parts as well. The fruit of this variety is acid and makes excellent jelly, for which purpose it is used. The size of the tree is about that of *P. emarginata.*

WESTERN CHOKE-CHERRY.

Prunus demissa,† Walpers.

The prefix of "Western" is to distinguish this species from its Eastern congener, which has always been known as the Choke-cherry. A shrub from 8 to 10 feet high and from 1 to 3 inches in diameter, it occurs in large quantities in the Dry Belt, along the beds of streams, and other localities where there is a sufficiency of moisture. It is not found to the westward of the Coast Range on the Mainland, but, like some other dry-country plants, it reappears on Vancouver Island in limited quantities and isolated localities. The leaves are somewhat thick, smooth on the upper surface, from 2 to 4 inches in length and 2 inches broad, very finely serrated and acuminately pointed.

The flowers are very handsome, much larger than those of *P. emarginata,* and are borne in pendant racemes along the ends of branches. The fruit, about the size of the very largest pea, is usually black when ripe, but often a deep red. It ripens about August, when it is gathered by the natives for food, either fresh or dried, and sometimes crushed in mortars and made into cakes, this process imparting the bitter almond flavour. It is not an unpleasant fruit, especially after it has been touched by frost, when it becomes quite sweet with a slight astringency. The bark is usually a deep brown, becoming roughened with age. A form of disease known as black-knot, a well-known enemy of plums and cherries in the East, attacks this Cherry; although so far it does not seem to have affected the cultivated varieties in this Province.

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* *Pennsylvanian.*

† *Low, weak; the stems are slender and inclined to bend over.*

Prunus demissa.

WESTERN SERVICE-BERRY; SASKATOON; JUNE-BERRY.

*Amelanchier alnifolia,** Nuttall.

This shrub occurs all through the Province. It bears early in the spring loose racemes of white flowers, each with five large petals, which completely cover the shrub with a mantle of white. The fruit, of a black or dark-purple colour, is borne in abundance. The berries are about the size of the very largest pea,

* *Alder-leaved; from a supposed resemblance of its leaves to those of the Alder.*

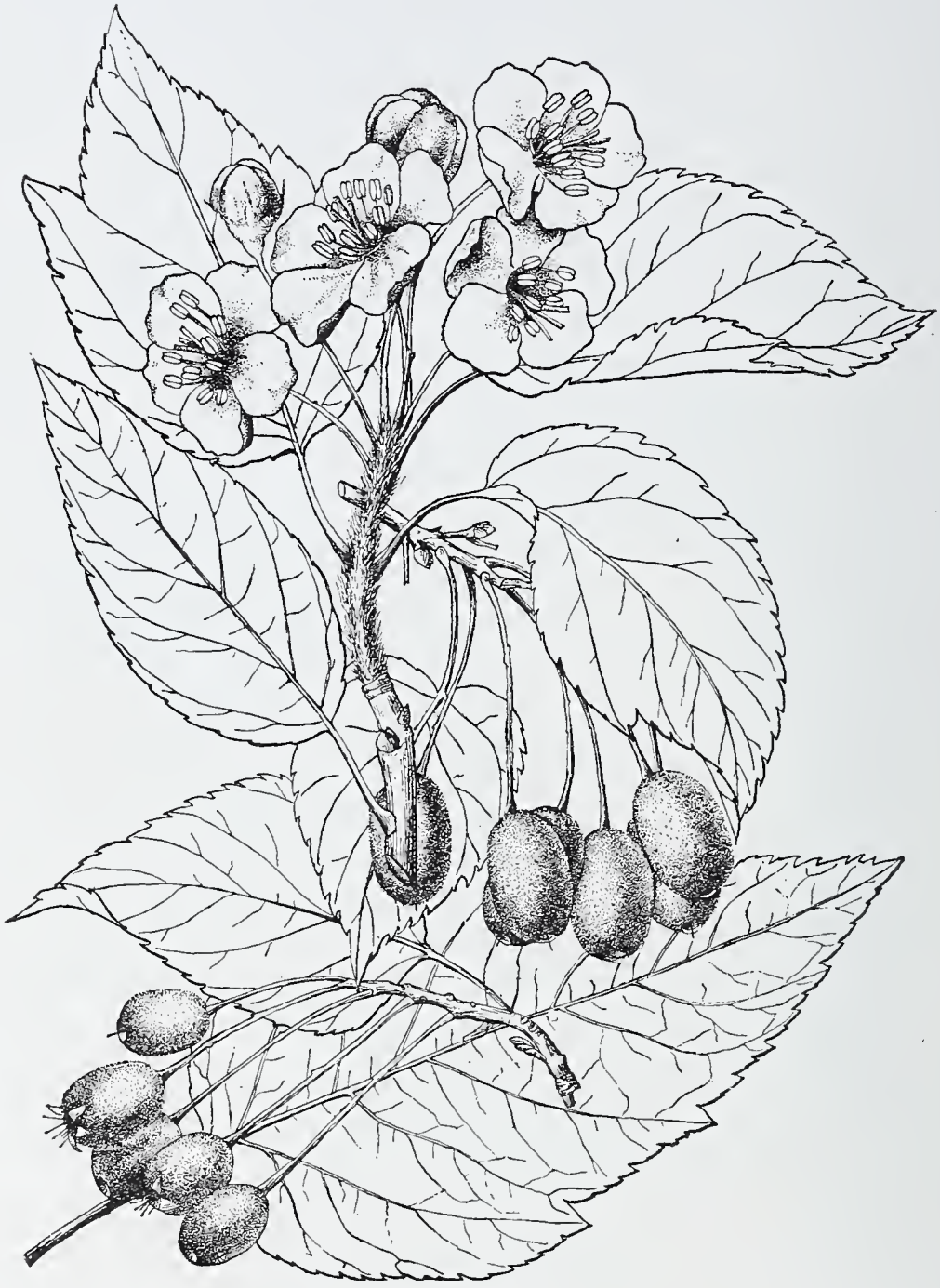
with a conspicuous calyx, and, except for the large seeds, very agreeable. It is closely allied to the Pear, and is in fact called by the French-Canadians " Poire."

A variety of this shrub occurring in the Eastern part of the continent is similar in all respects, except for a slight difference in the leaf and in the size of trunk, the Eastern variety often attaining the size of 6 inches in diameter and 30 feet in height; whilst our variety is seldom of larger diameter than 3 to 4

Amelanchier alnifolia.

inches and 10 to 15 feet in height and usually much smaller. The Eastern variety is called specifically *A. canadensis.*

The fruit of this plant was, and is still, extensively used as an article of food in a dried state and in the manufacture of pemmican by the natives of the adjoining Provinces. The wood, being hard and tough, is used almost exclusively for bows and arrows by the Indians of the Interior and of the Plains.



Pyrus (Malus) rivularis.

NINEBARK.

*Physocarpus opulifolius,** Maxim.; *Neillia opulifolia,* Brew. & Wats.

It is called Ninebark on account of the peculiarity of the shreddy bark which comes off in layers, but I have never ascertained whether there are really nine layers. It is usually classed as a bush, although I have seen specimens which nearly attain to the dignity of trees on the Lower Mainland and Vancouver Island. On the Upper Mainland, however, it never grows to any size. Its habitat is along streams and in damp places and its range is all over the Province in those localities. The flowers are white, in corymbs at the ends of the branches. The leaves are somewhat the shape of a maple-leaf, three-pointed and irregularly serrated. The sap-wood is light coloured and the interior a dark brown, very useful for inlaying.

OREGON CRAB-APPLE.

Pyrus rivularis,† Dougl.; *Malus rivularis,* Roemer.

A small tree or large shrub often attaining a diameter of 9 or 10 inches and a height of 25 to 40 feet; its commoner habit is a bushy form, and in its natural habitat it forms dense thickets, difficult to penetrate on account of the frequent prostrate trunks and the sharp spines with which the branches are covered. The wood, hard and close-grained, is principally used for rollers in mills and similar purposes, for which it is well adapted. The bark, smooth and light brown when young, is darker and rougher on old trees. The leaves resemble those of the domestic apple, but are somewhat smaller and are slightly hairy and serrated. The flowers are white, in bunches, resembling apple-blossoms, and quite fragrant. The fruit, of oblong shape, ½ to ¾ inch long, is green, gradually turning to a dull yellow when ripe, and often splashed with red on the sunny side. It is intensely acid, but makes good jelly and preserves. The natives use it cooked and mixed with oolhan grease, and in that form it is considered a great delicacy.

Crab stocks are sometimes used for grafting apples upon, for which purpose they are well adapted when good and healthy. The range is all over the Islands and the Lower Mainland to the westward of the Coast Range, and the habitat swamps and river-bottoms.

WHITE THORN; BLACK HAW.

Cratægus Douglasii,‡ Lind.

This (and possibly other varieties) is found in most parts of the Province growing to the size of 6 inches in diameter and from 12 to 20 feet high, but usually it is found in a dense bushy form, covered thickly with formidable sharp thorns which render the thickets quite impenetrable. The leaves are a bright glossy green, from 2 to 3 inches long, and of a peculiar shape, in that they are usually wider at the upper than at the stem end. They are rather coarsely toothed and divided at the upper end into five or six points. The flowers are white, in corymbs, with a most disagreeable odour, something like bad fish, a characteristic by which this tree or, rather, shrub is easily identified.

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* *Opulus-leaved; i.e., having leaves like those of* Viburnum opulus, *the Snowball Tree or Guelder Rose.* † *Stream-loving.* ‡ *Douglas's; after David Douglas.*

The fruit, which is usually borne in great quantities, is black, about the size of the largest pea, with a prominent open calyx and full of coarse seeds. It is quite sweet and pleasant to taste, but rather dry. The wood is white and dense, but of no commercial value. The bark is peculiarly white, even in old trees. Professor Sargent, the American authority on forestry, has been working on this genus and makes out 115 varieties in America. Here in British Columbia

Cratægus Douglasii.

we have at least one other variety similar in all respects to that under review, except that it has dark-red fruit. This variety I have found only in the Upper Country in the vicinity of Armstrong. Being closely allied to the Pear, that fruit can be grafted on the White Thorn, but I found in one instance that Bartletts, although attaining a fine size, altogether lost their identity and were quite worthless.

COMMON SPIRÆA; OCEAN-SPRAY.

*Spiræa discolor,** Pursh; *Holodiscus discolor,* Maxim.

It seems strange to the ordinary person that a shrub so well-known should have such an inappropriate designation as *discolor,* yet such is the case; the explanation will be found in the foot-note. This is one of the handsomest of our flowering shrubs and is common throughout the Province. The beautiful plume-like compound panicles of white flowers, often 12 inches in length, attain their greatest perfection when growing in the shade, and give this plant a special value for growing in shrubberies. The leaves also are very beautiful, contrasting well with the pendant flowers. They are of a delicate green, from 2 to 4 inches in length and two-thirds as wide, coarsely dentate and serrate. The *Spiræa* often attains a height on the Coast of from 10 to 15 feet and a diameter of from 2½ to 4 inches.

The wood is often called Ironwood, being of great density and very hard and strong. The natives make use of it for various purposes when strength and durability are required, such as the making of spear-points, digging-sticks, etc. It is an excellent wood for the manufacture of fishing-rods, for which it is now frequently employed.

GOAT'S-BEARD SPIRÆA.

Spiræa aruncus,† Linn.; *Aruncus sylvester,*‡ Kost.

This is a deciduous plant growing on banks of streams and in shady, damp localities. When growing luxuriantly it attains a height of 6 to 7 feet. The flowers are small, of a yellowish-white colour, and are borne in graceful spikes up to a foot or more in length, often with many lateral spikelets. The staminate and pistillate flowers are on separate plants, easily recognizable. The great bright-green leaves, averaging in size probably 6 inches, clothe the plant thickly from its root upwards. This feature, combined with the beautiful spikes of flowers, at once places this plant in the foremost rank as an ornamental one. The range is widespread, occurring as it does in all favourable localities in the Province.

HARDHACK.

Spiræa Douglasii,§ Hook.

Hardhack is a shrub common throughout the Lower Mainland and the Islands in swamps on the margins of lakes and in low wet lands, where it grows in dense masses, all but impenetrable. The height is from 4 to 7 feet, with a conspicuous spike of rose-pink flowers, 6 or 7 inches long, at the tops of the stems. It is very beautiful when at its best, but soon becomes faded when exposed to the sun. The leaves are of a somewhat dull green, lighter on the lower sides, from 1½ to 2 inches long, oblong and serrate towards the upper end.

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* *Changing colour; the white panicles of blossoms become brownish with the ripening of the seeds.* † *A goat's beard; the application is doubtful.*

‡ *Pertaining to woods or forests.* § *Douglas's; after David Douglas.*

ROSE-COLOURED SPIRÆA; MOUNTAIN SPIRÆA.

*Spiræa rosea,** Koehne; *Spiræa densiflora,†* Nutt.

This is a small shrub about 12 inches in height, with pretty rose-coloured flowers, borne in clusters 1 to 2 inches across at the ends of the stems. It occurs on high mountain-sides on Vancouver Island and on the Mainland in open places.

BIRCH-LEAVED SPIRÆA.

Spiræa betulifolia,‡ Pallas; *Spiræa lucida,§* Douglas.

As its name indicates, this plant has leaves resembling those of the Birch. It is a small shrub from 1 to 2 feet high, having a corymb of yellowish-white flowers. It is common on hillsides in the Interior of the Province.

DWARF SPIRÆA.

Spiræa pectinata,|| Torr. & Gray.

The Dwarf Spiræa is only partially shrubby, but is included here on account of its relationship. It is a small moss-like plant from 2 to 4 inches in height, of a vivid green, and having pretty little spikelets of white flowers. It occurs very commonly on all the high mountains in the Province near the snow-line.

SALMON-BERRY.

Rubus spectabilis,¶ Pursh.

This is the largest, both as regards size of plant and fruit, and the handsomest, as regards flowers and fruit, of all our native Raspberries. When growing luxuriantly it attains a height of 12 to 15 feet and is commonly 6 to 10 feet high. The outer bark on the old stems becomes shreddy and peels off. The young vigorous shoots have a crimson or red skin, thickly covered with thorns. These shoots before they become woody are a favourite delicacy with the Indians. On the Columbia River, where the vernacular name originated, the tender shoots were eaten with dried salmon-roe. The leaves are usually in threes (trifoliate), the leaflets ranging in length from 2 to 4 inches, deeply and irregularly serrated. The flowers, which occur at the ends of the old branches, are about 1 inch across and are of a beautiful rose colour. The fruit is usually orange in colour, often dark crimson or nearly black when ripe, rarely white or very light yellow, and when in perfection fully 1 inch in diameter. When fully ripe it is sweet and very juicy, but being very soft it is not suited for transportation or for preserving. Its range is all over Vancouver Island, the Islands, and the Mainland to the westward of the Coast Range, but it is not found in any part of the Mainland to the eastward of that range. Its habitat is in moist rich bottoms and along margins of streams.

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* *Rosy.* † *Densely flowered.* ‡ *Birch-leaved.* § *Shining; from the smooth stems.*
|| *Comb-like; the stamens are thus united at the base.*
¶ *Showy, striking; referring to the flowers.*

THIMBLEBERRY; WHITE-FLOWERED RASPBERRY; THORNLESS RASPBERRY.

*Rubus nutkanus,** Moc.

This Raspberry has had more vernacular names applied to it than any other, and they are all more or less appropriate, except that of " Salmon-berry," which is the common name of *R. spectabilis*. It is a very common shrub throughout the Province and not at all particular as to its habitat, occurring as it does on dry hillsides, damp bottoms, at sea-level, and on high mountains. It grows usually in dense masses, especially on the west coast of Vancouver Island, where it is only with the utmost difficulty a way can be forced through it. Its height is from 2 to 7 feet and even more. The leaves are large, from 6 to 12 inches across, nearly round in the general contour, usually three-lobed and sometimes five. They are irregularly toothed and quite hairy, as are also the stems and petioles. The stems are quite green when young, turning later on to a black-brown, and absolutely without any appearance of thorns. The flowers are a pure white, 2 or 3 inches across (one of the botanical names is *R. parviflorus,* a manifestly misleading and inappropriate term). The fruit is red, very small seeded and velvety, the usual shape of a raspberry, but more flat and shallow. It has but little substance, and although sweet is rather flavourless.

BLACK RASPBERRY; BLACK-CAP.

Rubus leucodermis,† Dougl.

The botanical name indicates a white bark or skin which it has most distinctly. The under-sides of the leaves are also white and contrast very vividly with the dark green of the upper sides. The leaflets are usually in threes, irregularly toothed and serrated. They vary greatly in size, from 1½ to 4 inches in length. The flowers are white, usually in clusters on the wood of the previous year, which dies off after the second year. The fruit is a deep purple, nearly black when ripe, without much distinctive flavour, but sweet and pleasant. The bush attains a length of 5 to 7 feet, the slender ends bending over and often touching the ground and taking root. The stems are thickly covered with sharp curved thorns. Its range is quite extensive throughout the Province on dry exposed hillsides and burnt-off areas.

RED RASPBERRY.

Rubus strigosus,‡ Michx.

This Raspberry resembles the ordinary cultivated varieties so closely in every respect that it does not need any particular description for identification. It grows to a height of from 2 to 5 feet, with leaves like the garden Raspberry. The flowers are inconspicuous, being small and white in colour; the fruit is red, richly flavoured, and juicy. It does not occur, to my knowledge, to the westward of the Coast Range, but is abundant to the eastward, especially on burnt areas and on hillsides.

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* *Belonging to Nootka; from where it was first reported.* † *White-skinned.*
‡ *Covered with sharp bristles; referring to the stems.*

TRAILING BLACKBERRY.

*Rubus macropetalus,** Dougl.; *Rubus ursinus,*† Cham. & S.

A trailing plant abundant in burnt areas, covering logs, stumps, and rocks, and often growing in a single season under favourable conditions to a length of from 10 to 15 feet. The leaves are usually trifoliate, turning to a dull red and falling off as winter approaches in open places, but often persistent and remaining green all winter in sheltered localities, underneath trees, etc. It is thickly covered with thorns and sometimes forms barriers difficult to penetrate. The flowers are loose, white, and large, and the fruit when perfectly ripe is nearly black and has the usual core found in blackberries. It is the most delicious of all our native fruits of this family and is highly esteemed for preserving. Its range is confined to the Islands and to the Coast of the Mainland, not being found to the eastward of the Coast Range.

CREEPING RASPBERRY.

Rubus pedatus,‡ Smith.

A small creeping herbaceous plant of this tribe; it is found on all the mountain ranges in the Province. Not more than 6 inches high but several feet long, it trails over mossy ground and logs. It is thornless and the bright-green trifoliate leaves stand erect, the leaflets ½ to 1 inch long. The flower is white and forms a pretty garland standing up amongst the green leaves. The fruit is a small, very acid red berry borne in clusters of several.

ARCTIC RASPBERRY.

Rubus arcticus,§ Linn.

This is a small plant about 6 inches in height, with the usual trifoliate leaves. The flower, quite large in comparison with the size of the shrub, is of a pink colour, somewhat resembling that of the Salmon-berry. The fruit is yellow or orange and highly esteemed for its fine flavour. It is found in low damp situations in the Rocky Mountains and probably in other similar localities.

DEWBERRY.

Rubus triflorus,‖ Richards; *Rubus pubescens,*¶ Raf.

This small Raspberry, only a few inches in height, is found in the woods of the Upper Mainland. It is quite thornless and has white flowers usually in threes; hence the name. The fruit I have had no experience with, but I am informed it is of no economic value.

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* *Large-petalled.* † *Pertaining to bears; from their fondness for the fruit.*
‡ *Footed; from the shape of the leaves.* § *Arctic; it is found as far north as the Arctic regions.* ‖ *Three-flowered; the flowers are usually in threes.*
¶ *Downy; leaves and sepals are downy.*

MOUNTAIN RASPBERRY.

*Rubus nivalis,** Dougl.

A small creeping variety which I take the liberty of calling "Mountain-raspberry," as mountains form its usual habitat. I have seen it only in the mountains of the Beaufort Range, behind Cumberland, where it was found by my brother, Walter B. Anderson. The leaves are nearly round, divided into three lobes, and of a bright glossy green. I have seen neither the flower nor the fruit, but I believe the former is red, and the latter also red in colour.

COMMON WILD ROSE.

Rosa nutkana,† Presl.

This is the common roadside Rose which abounds near Victoria and on the Islands and Lower Mainland generally, the fragrance of which is so well known and appreciated, being sweeter than that of any of the cultivated varieties. It is a strong-growing shrub, frequently attaining the height of 12 to 15 feet, but commonly 4 to 6 feet, and having the stems armed with formidable thorns which render thickets all but impenetrable. These sturdy stems are used by florists as stocks for standard Roses. The flowers, mostly solitary and varying in shade from a deep rose to nearly white, are from 2 to 3 inches across, with numerous yellow anthers in the centre. The fruit is quite large, sometimes 1 inch in diameter, and usually of a rich red colour, occasionally varying to orange. The leaves are of the usual type of rose-leaves, finely serrated, and from 1 to 2½ inches long. The favourite habitat is rich low bottoms, often near water.

SWAMP ROSE.

Rosa pisocarpa,‡ Gray.

I call this variety "Swamp-rose," as it usually occurs in low lands where water lies in the winter and on the margins of swamps. It is not as strong-growing nor as large as *R. nutkana,* the usual height being from 3 to 8 feet. It also has smaller leaves and flowers, the latter being in bunches at the ends of the stems, of a bright-rose colour, and coming into bloom much later than the other species. Flowers of this Rose are often to be found late in the autumn. The berries are numerous, borne in bunches, and much smaller than those of *Rosa nutkana,* from ¾ to 1 inch long, with very prominent calyx.

UPPER MAINLAND WILD ROSE.

Rosa acicularis,§ Lindl., var. *Sayi,‖* Rehd.; *Rosa acicularis,* Lindl., var. *Engelmannii,¶* Wats.

Both these varieties of *Rosa acicularis* resemble *Rosa nutkana,* but they are less vigorous in growth. The fruit varies in shape from roundish to pear-like. It is not at all unpleasant and is commonly used by the natives, care being taken to reject the seedy central portion. Neither are found west of the Coast Range, their habitat being the Upper Country.

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* *Pertaining to snow; from its elevated habitat.* † *Belonging to Nootka.*
‡ *Pea-fruited; referring to size of fruit.* § *Needle-like; referring to the thorns.*
‖ *Say's.* ¶ *Engelmann's.*

DWARF ROSE.

*Rosa gymnocarpa,** Nutt.

This Rose is to be found on the dry hillsides of Vancouver Island, the Gulf Islands, and the Lower Mainland. It seldom reaches a greater height than 4 or 5 feet. The stems are covered with numerous fine thorns, not at all formidable. The flowers, usually a pale pink, are small, only about ¾ inch across and almost devoid of odour. The fruit is elongated and has a diameter about equal to that of a lead-pencil. An excrescence is often seen at the upper end and it lacks the persistent calyx. The fruit is red or orange in colour and differs from that of the other Roses, in that it has not the same coarse fibrous covering to the seeds. The leaves are from ½ to 1 inch long and serrated.

SWEETBRIER.

Rosa rubiginosa,† Linn.

This is an introduced species which has become naturalized and is to be found in quantities on the roadsides in the vicinity of Victoria, especially near Colwood, where it was first introduced by the late Mr. Langford, about 1850. It is also established about New Westminster. The leaves are from 1 to 1½ inches long, bright green, deeply serrated, and having the well-known perfume from which it obtains its English name and by which it is easily recognized. The flower is from 1 to 1½ inches in diameter, with pink petals slightly yellow towards the centre. It fruits heavily and is thus quickly distributed by birds throughout the district. The colour of the berries is orange-scarlet.

OSO-BERRY.

Nuttallia cerasiformis,‡ Torr. & Gray; *Osmaronia cerasiformis,* Greene.

The Oso-berry is a shrub from 5 to 12 feet high. The leaves, from 2 to 4 inches long and from 1 to 1½ inches broad, are pointed at both ends and slightly waved at the edges. The flowers appear very early in the spring, before the leaves develop, often as early as February at Victoria. They are white and borne in racemes along the stems, with an agreeable odour of the character of bitter almonds. The fruit, at first red, turns to a deep purple with a rich bloom when ripe. It is about ⅝ inch in diameter, often ½ inch long, with a deep score on one side like some plums and a large stone. Whilst not poisonous, it is not at all pleasant and rather nauseous. It is common in rich bottoms on the Islands and the Lower Mainland.

GREASEWOOD.

Purshia tridentata,§ DC.

This is essentially a desert shrub and occurs only in the desert portions of the Upper Mainland in and about the Similkameen and Osoyoos. It is by no means

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* *Naked-fruited; from the absence of the calyx on the fruit.*

† *Rusty, reddish; from the rusty hue given the leaf-stalks and leaflets below by the numerous glands.*

‡ *Cherry-like; the clusters of fruit resemble somewhat those of the Cherry.*

§ *Three-toothed; descriptive of the shape of the leaves.*

a shrub of prepossessing appearance, being short and shrubby and covered with very small, dull-green, three-toothed leaves. A number of these shrubs growing in a plain and viewed from a distance are curiously like a herd of cattle. The flowers are a pinkish-white, small and inconspicuous. The wood is crooked and brashy, useful for fires where other fuel is unobtainable.

SHRUBBY CINQUEFOIL; SHRUBBY POTENTILLA.

*Potentilla fruticosa,** Linn.

Amongst the many Potentillas in this Province, this is the only one which grows in a bush form. Its height is from a few inches to 3 and 4 feet. The compound leaves are a deep green above, but thickly covered with very fine white hairs underneath, so that they have the appearance of being white on the underside. The leaflets, five to six or seven, quite narrow and pointed, are from ½ to 1 inch in length. The flowers, a bright yellow, ½ to ¾ inch across, are borne in clusters at the ends of the stems. Its range is all over the Province in open places on high mountains.

ELDER-LEAVED MOUNTAIN ASH.

Pyrus sambucifolia,† Gray; *Pyrus sitchensis,*‡ Piper.

This tree, or rather shrub, bears a general resemblance to the European Mountain-ash or Rowan-tree, commonly grown in gardens, as regards foliage, flowers, and fruit, but is less robust and partakes more of the characteristics of a shrub than a tree. Often it is only a few feet high and seldom exceeds 12 feet, having usually several leading stems with pliable straggling branches, which are quite smooth and with greyish bark. The leaves are compound, the leaflets from ten to fourteen in number, resembling, as the name implies, those of the Elder, and from 1½ to 2½ inches long and ½ to ¾ inch wide. They are sharply serrated and of a vivid green colour. The flowers, of a yellowish-white in large flat cymes from 3 to 5 inches across, are borne at the ends of the branchlets. The berries are somewhat larger than those of the cultivated variety and of a light red, their weight often bending the slender branches to the ground. Its range is general in the Province on mountains at altitudes of 4,000 to 7,000 feet.

WESTERN MOUNTAIN ASH.

Pyrus occidentalis,§ Wats.

This is a smaller shrub than the Elder-leaved, sometimes only a foot or so high, and never more than 6 feet, the stems and branches being quite slender. The principal difference is in the leaves, which are also compound, but the leaflets are fewer, from eight to ten being the usual number. They are also smaller, about 1½ inches long and ½ inch across, and only slightly serrated at the apex, sometimes almost devoid of serrations. The flowers, borne in smaller cymes at the ends of the branches, are white and the fruit red. I have only collected this variety on Mount Cheam, at an altitude of 6,000 to 7,000 feet, but it probably exists at those altitudes elsewhere in the Province.

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* *Shrubby.* † *Elder-leaved.* ‡ *Belonging to Sitka.* § *Western.*

SAXIFRAGACEÆ.

SYRINGA; MOCK-ORANGE.

*Philadelphus Lewisii,** Pursh.

This is a highly ornamental shrub from 5 to 15 feet high. The leaves are from 2½ to 3 inches in length and about 2 inches broad, terminating in quite an acute point, slightly waved and finely but sparsely serrated. The beautiful white flowers, about an inch across, occur abundantly at the end of the branches, usually in couples, starting from the axils of the terminal leaves, and are very fragrant. The range of this shrub is very great, occurring as it does all over the Mainland and Islands in suitable localities—namely, dry, open rich land, or amongst other low shrubs on hillsides. This is one of our most beautiful plants.

SMALL BLACK GOOSEBERRY.

Ribes divaricatum,† Dougl.

A shrub growing from 3 to 12 feet high, with most formidable thorns, usually in threes. The leaf is from 1 to 2 inches across, deeply divided usually into three lobes, sometimes more, somewhat cordate or heart-shaped at the base, the edges rounded and coarsely incised. The flower has reddish petals with a white centre and prominent anthers extending well beyond the tube. The fruit is black, about the size of an ordinary pea, with a very prominent calyx; when ripe it is well flavoured and quite sweet. It is excellent for preserves. The range is all over the Islands and the Lower Mainland, in thickets and damp spots.

RED-FLOWERED GOOSEBERRY.

Ribes Lobbii,‡ Gr.

This shrub, which is from 3 to 5 feet high, is the handsomest of our Gooseberries. The leaves are not large, from ¾ to 1 inch across, deeply three-lobed and irregularly toothed. The stems, stiff and branching, are studded with formidable thorns. The flowers are from ½ to ¾ inch long, with dark-red petals and white trumpet-shaped centres, out of which protrude the conspicuous anthers, making the whole exceedingly attractive. The fruit averages about an inch in length, often nearly round, but usually longer than wide. When ripe it is of a bright-crimson colour, with an excessively hairy and sticky thick skin. It is sweet and pleasant to the taste, but has to be peeled before eating. Its range is all over the southern portion of the Islands and Mainland, in the open or in thinly wooded areas in dry gravelly soil. It is not found eastward of the Coast Range on the Mainland.

SMALL GOOSEBERRY.

Ribes lacustre,§ Poir.

A small weak-growing shrub usually to be found along watercourses and damp places in shady localities. It is from 2 to 4 feet in length, often lying prostrate, owing to the slender stems and heavy foliage and fruit. The stems are thickly covered with very fine thorns. The flowers, of a tawny-white colour,

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* *Lewis's.* † *Spread apart; the position of the thorns.* ‡ *Lobb's.*
§ *Pertaining to lakes; habitat.*

are in racemes borne thickly all along the stems. The leaves are usually in threes or fours, varying in size from ½ to 1½ inches, of a bright-green colour and divided into several lobes, usually five, deeply and irregularly toothed. The fruit, which is small and deep purple in colour, has a disagreeable bitter taste. The range is pretty well all over the Province in favourable localities.

MOUNTAIN GOOSEBERRY.

*Ribes irriguum,** Dougl.

A fine large-fruited Gooseberry closely resembling *Ribes divaricatum,* but differing in that it has a great number of fine thorns in addition to formidable large ones in twos. It grows to a height of 4 to 5 feet. The leaves, about 1 inch each way, are parted into three lobes, the whole bluntly toothed and rounding. The fruit, a deep purple, is round, about the size of the largest pea, with the characteristic protruding calyx. Its range is confined to the Upper Mainland, on high mountains along the margins of streams.

SMOOTH GOOSEBERRY.

Ribes oxyacanthoides,† L.

This small shrub occurs, so far as I have observed, only to the eastward of the Coast Range on the Mainland, along streams. The leaves are quite small, rarely over ¾ inch across, oftener smaller, roundish and five-lobed. The flowers, white and inconspicuous, are in twos. The stems have a few insignificant thorns.

RED-FLOWERING CURRANT.

Ribes sanguineum,‡ Pursh.

This most beautiful shrub is from 3 to 10 feet high. The leaves, covered with a soft down, are from 2 to 3 inches across, three to five lobed, and with edges somewhat rounding. The flowers are in loose racemes along the branches towards and near the ends, the colour varying from a light pink to a deep red with white centres. The fruit is a dark blue or purple covered with a white bloom, and about the size of a large black currant but more elongated. Whilst of no economic value as a fruit, principally on account of its large seeds and lack of juice, it is not unpleasant, being sweet with an agreeable flavour. Its range is quite wide, embracing the greater part of the southern portion of the Province, and attaining its greatest perfection near the sea-coast. Its habitat is on banks and rocky slopes, usually in light thickets.

BLACK CURRANT.

Ribes bracteosum,§ Dougl.

The height of this shrub is hard to estimate on account of the pliable stems, which frequently become prostrate from various causes. It is often found from 8 to 10 feet high. The leaves are shaped like the traditional Canadian Maple-

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* *Swampy, wet; habitat.* † *Hawthorn-like; from the specific name of the common Hawthorn, which it resembles in leaf.* ‡ *Blood-red.*

§ *Bract-bearing; from the leaf-like bracts of the inflorescence.*

leaf, with from five to seven points or lobes, coarsely and irregularly serrated, and varying in size from 2 to 6 inches across—a very handsome leaf. The flowers are in racemes, sometimes 6 inches in length, borne towards the ends of the branches.

The colour of the flower is hard to describe, greenish with a light tinge of purple. The fruit is about the same size as the cultivated black currant, which it also resembles in flavour, but more pronounced. The colour is a deep purple with a white bloom. It also has the characteristic odour of the black currant more strongly emphasized, and by this the shrub can almost without mistake be identified. Its range is throughout the Islands and the Lower Mainland along watercourses.

VISCID CURRANT.

*Ribes viscosissimum,** Pursh.

This is a shrub 3 to 5 feet high and rather rigid in its growth. The leaves are from 1½ to 2 inches in size, divided usually into three rounded lobes, quite irregularly crenate or round-toothed. The flowers, a yellowish-white, ½ inch or more long and trumpet-shaped, are borne at intervals along the stem in short racemes, in bunches of three or four in the axils of the leaves. The fruit is dark purple or black, and fruit, leaves, and flowers are covered with a viscid sticky substance; hence the name. Its range is confined to the Dry Belt of the Mainland, and its habitat hillsides in open or thinly wooded, rocky situations.

WAXY CURRANT.

Ribes cereum,† Dougl.

This shrub, 3 to 5 feet high, is of very rigid growth. The leaves are rounded at the upper ends, from ½ to 1 inch across, divided into several indistinct lobes irregularly toothed, of a dull-green colour, and very stiff and rigid. It derives its name from a waxy secretion about the leaves and fruit. The flowers are white, trumpet-shaped, about ½ inch long, and borne in threes and fours in the axils of the leaves on a short stem. The fruit is a bright red, quite smooth, and about the size of a pea, with a very prominent calyx. Its flavour is sweet but nauseous. Its range is confined to the arid interior of the Mainland, and its habitat hot gravelly or rocky localities.

WHITE-FLOWERED CURRANT.

Ribes hudsonianum,‡ Richard.

This Currant is a shrub about 4 feet high with stiff erect stems. The leaves, from 1½ to 3 inches across, are somewhat cordate at the base, and in appearance closely resembling those of *R. bracteosum,* so common about streams on Vancouver Island and the Lower Mainland, usually conspicuously three-parted, with lesser partings, the whole coarsely and irregularly toothed. The flowers, in racemes 2 inches long, are borne along the stems towards the ends and are a pure white. The fruit is quite large, round, and dark purple or black. Its range is confined to the Mainland to the eastward of the Coast Range, and the habitat margins of watercourses.

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* *Very sticky.* † *Waxy.* ‡ *Hudsonian; found (probably first) about Hudson's Bay.*

LOOSE-FLOWERED CURRANT.

Ribes laxiflorum,* Pursh.

This shrub is from 4 to 5 feet high with leaves three to five lobed, rather acutely pointed, and from 2½ to 3 inches across. The small flowers, of a dull reddish colour, are in upright racemes, borne profusely along the stems. The fruit, a dark purple covered with a white bloom, is quite large and well flavoured. It is found on mountain-tops on the Island and Southern Mainland and at sea-level in the northern part of the Province. It is also quite abundant on Queen Charlotte Islands.

MOUNTAIN CURRANT; FETID CURRANT.

Ribes prostratum,† L'Her.; *Ribes glandulosum*,‡ Grauer.

The Fetid Currant is a shrub from 3 to 5 feet or more in length, and, as its first specific name indicates, has a prostrate habit. This is due to the conditions of its natural habitat on high mountains where heavy snows prevail. The leaves are from 2 to 2½ inches across, usually three-lobed, the lobes rather pointed and coarsely toothed. The fruit is purple and covered with a fine white bloom.

ARALIACEÆ.

DEVIL'S-CLUB.

Fatsia horrida,§ Benth. & Hook.; *Echinopanax horridus*,§ Dechne. & Planch.

This shrub is well named, being covered with thorns from the root up, including the backs of the leaves and flower-stems. The thorns are poisonous, as I can certify from personal experience. Nevertheless, it is a handsome shrub with its great leaves 9 to 12 inches across, resembling those of the Thornless Raspberry. It bears spikes of greenish-white flowers at the ends of the stems, developing later on into a superb spike of bright-red berries, looking as if made of sealing-wax. It is a plant well worth the trouble of cultivating in large grounds. Its height is from 4 to 10 feet, often bent to the ground by snow or by its own weight, the ends springing up again in an upright position. In forcing a way through a thicket, therefore, it behoves one to be wary, or a false step may result in a wound in the face or hands as the result of an upright stem flying back. Its range is all over the Province, and its habitat shady, cool stream-beds and wet ground.

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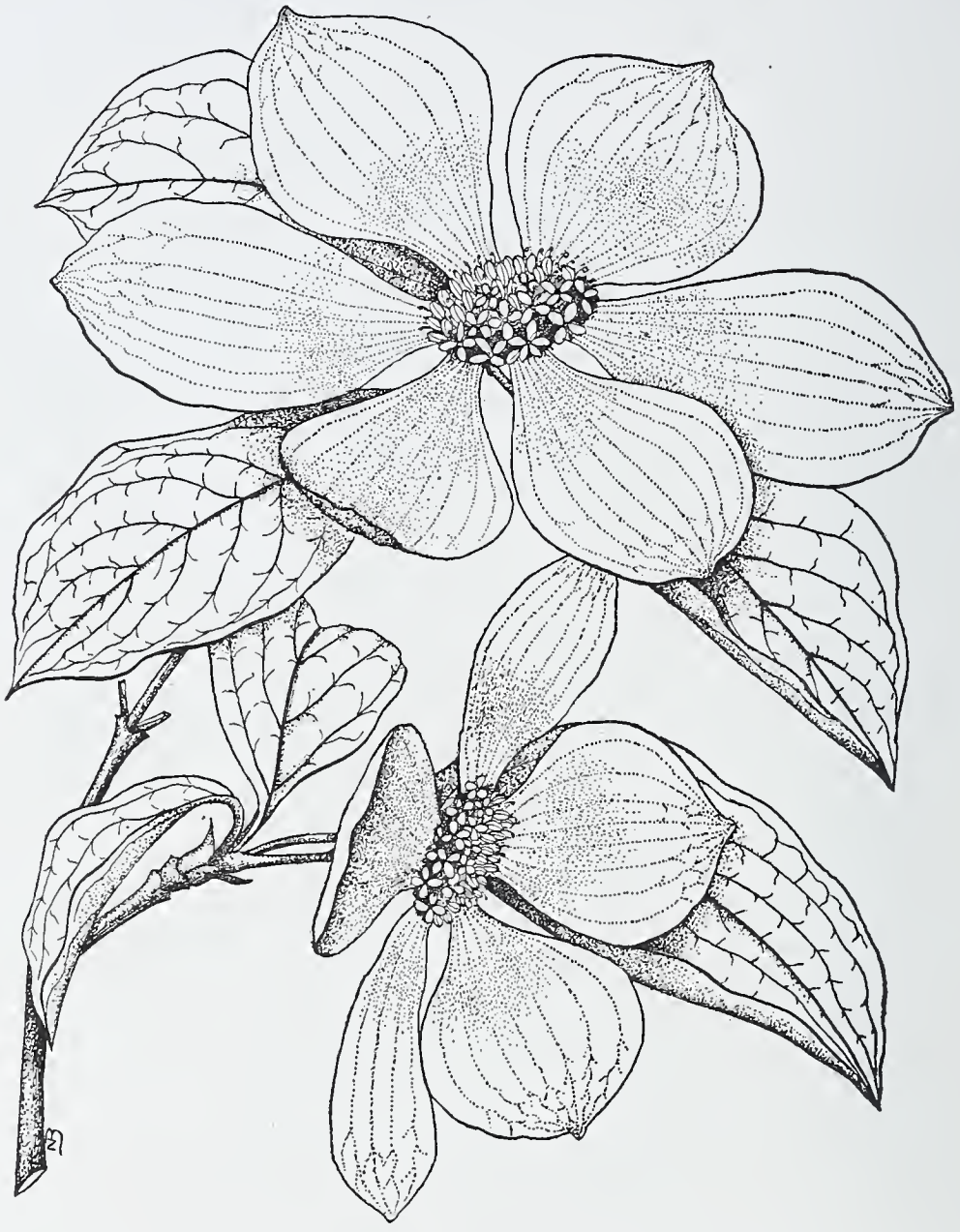
* *Loose-flowered; from the spreading form of the racemes.* † *Prostrate.*
‡ *Glandular; from the glands found on the fruits and flower-stalks.* § *Spiny, prickly.*

CORNACEÆ.

WESTERN DOGWOOD; FLOWERING DOGWOOD.

*Cornus Nuttallii,** Aud.

This highly ornamental tree with immense white flowers is fairly abundant throughout the Islands and on the Coast of the Mainland. The term " flowers " is here used for popular reasons; it may be explained, however, that the large white so-called petals are really the bracts enclosing the flowers, which are quite small and bunched in dense clusters. These appear in small green knobs in the late winter, gradually increasing in size. The white bracts, which are at first



Cornus Nuttallii: flowers enclosed by bracts.

* *Nuttall's; after Thomas Nuttall, an American botanist.*

green, appear in the early spring, and slowly develop until they attain a diameter of from 4 to 5 inches across. A peculiarity of this tree is that many individuals have a habit of flowering twice in the season. These are to be seen in bloom about the month of September.

The fruit is borne in dense spherical heads of thirty or forty drupes, which turn red as they ripen and form a favourite article of food for birds of various kinds, including grouse. The leaves, from 3 to 4 inches long, with smooth edges, are of a dull green, turning to a dull red in the autumn. A curious fact I have observed is that on mature trees the leaves often appear on the terminal

Cornus Nuttallii: fruit and immature flower cluster.

branchlets in nines. I do not give this as an invariable rule, but in my experience it is fairly constant. The tree often attains a size of 12 inches in diameter and a height of 30 feet or thereabouts, but more frequently smaller.

The wood is fine-grained, hard, of a pinkish colour, and takes a good polish. It is not used commercially in the Province, except in isolated cases. Of late, however, a demand for the wood for exportation has sprung up, I am informed, for making spindles or reels for thread, piano-keys, and such purposes. The bark is smooth and of a greyish-white. It is a tree well worth cultivating, but is rather difficult to transplant on account of its favourite habitat, which is usually dry, stony, and gravelly soils amongst other trees.

Western Dogwood in flower, Vancouver Island. Photo. Harold Fleming.

RED-BARKED DOGWOOD.

*Cornus pubescens,** Nutt.

This is a shrub from 10 to 15 feet high or even more, seldom exceeding 2 inches in diameter, and more frequently smaller. The colour of the young branches is a tawny red, the old trunks becoming roughened and dark with age. The leaves are from 2 to 4 inches long and 1 to 2½ inches wide, rounding at the base and terminating in an acute point, with smooth edges and very distinctly veined, of a rather dull green above, the under-side being covered with fine pubescent hairs, giving it a whitish appearance, from which it derives its specific botanical name. The leaves turn a dull red in the autumn and often remain persistent until quite late in the winter. The flowers, borne at the ends of the branches in umbels or cymes, are white. The fruit, about the size of a red currant, is white, of a bitter acid taste, and with a large seed or stone in the centre. Its range is all over the Province, and its habitat margins of streams and in swamps.

PIGEONBERRY; BUNCHBERRY.

Cornus canadensis,† Linn.

The third representative of the Dogwood family is a beautiful little plant about 6 inches high, bearing a number of leaves at the top surmounted by what appears to be a single white flower about ¾ inch across, but which in reality is a bunch of small flowers enclosed by white bracts in the same manner as its large congener, *C. Nuttalli.* Later these develop into bunches of bright-red berries of the size of small peas. Its range is all over the Province in damp woods.

CAPRIFOLIACEÆ.

SNOWBERRY.

Symphoricarpos racemosus,‡ Michx.

This pretty shrub, belonging to the Honeysuckle family, is called Snowberry on account of the white berries which hang on the bushes during the winter. It is a slender-growing shrub, the usual height of which is about 3 feet, often more, with pretty pink bell-shaped flowers borne in clusters rather than racemes at the ends of the slender twigs. Later on when the white berries, often larger than the largest pea, are mature, the twigs are bent and hang over gracefully. A peculiarity of this shrub is seen in the leaves, which, when they occur on a sturdy young shoot, are each deeply cleft into three or four lobes with the upper ends rounded. On the old stems the leaves are entire and just slightly waved on the edges. The leaf is from 1½ to 2½ inches long and about two-thirds as wide. It is common along roadsides.

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* *Covered with soft short hairs.* † *Canadian.* ‡ *Flowers in racemes.*

CREEPING SNOWBERRY.

*Symphoricarpos mollis,** Nutt.

I have called this the Creeping Snowberry, as it is soft and low-growing, with slender branches which partly trail on the ground like Honeysuckle. The flowers resemble those of *S. racemosus,* but are borne more commonly along the stem in the axils of the leaves. The fruit is also white, but not so large and handsome. The leaves, somewhat pubescent, are smaller and often parted in several lobes. The range is general on the Island in dry gravelly soil in exposed situations, and possibly also on the Lower Mainland.

RED HONEYSUCKLE.

Lonicera ciliosa,† Poir.

This plant is so well known that it hardly requires a minute description. Its range is all over the Province in thickets and woods, often climbing to the tops of the trees 40 or 50 feet high. The colour of the flower varies from a deep red when occurring in a sunny situation to light orange in shady places. The fruit, four or five red berries, oblong in shape, is borne in the cup, at the ends of the stem, characteristic of the Honeysuckle. The leaf, a light green, nearly round and quite smooth, varies in size from 1½ to 2 inches.

SMALL PINK HONEYSUCKLE.

Lonicera hispidula,‡ Dougl.

This plant, as the English name I give denotes, is quite small compared with the climbing Red Honeysuckle, and as its botanical name indicates, it is hispid; that is, the stems are covered with short bristly hairs. It is semi-evergreen, many of the leaves of the season remaining on all winter. They are greenish-grey in colour, 1 inch or thereabouts in size, and smooth on the upper sides. The flowers are small, of a pinkish-lilac colour, and often occur in several whorls along the stem. The fruit, in elongated bunches, is bright red. Its range, in my experience, is the southern part of Vancouver Island, and its habitat dry rocky hillsides, usually trailing over rocks, stumps, and fallen trees, rarely climbing to any great height.

RED-FRUITED BUSH-HONEYSUCKLE; CANADIAN FLY-HONEYSUCKLE.

Lonicera ciliata,§ Muhl.; *Lonicera canadensis,*‖ Marsh.

A small shrub from 2 to 4 feet high whose range seems to be confined to the high lands of the Upper Mainland, on mountains amongst other shrubs. The leaves are ovate, thin, light green, and about 2 inches long. The flowers, in twos, borne at the ends of the branchlets, are yellowish-white, about ¾ inch long and trumpet-shaped. The fruit is red, consisting usually of berries in pairs in a cup.

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* *Soft, pliant.* † *Fringed with fine hairs on the margin; referring to the leaves.*
‡ *Minutely covered with short stiff hairs.*
§ *Fringed with hairs; referring to the leaves.* ‖ *Canadian.*

BLACK-FRUITED BUSH-HONEYSUCKLE; BLACK TWINBERRY.

*Lonicera involucrata,** Banks.

This shrub grows from 3 to 10 feet high, with fine dark-green oblong leaves from 2 to 4 inches in length and half as broad. The flowers, yellow and tubular, appear early in the spring before the foliage is fully developed, occurring mostly at the ends of the branches, usually in pairs which later develop into black fruit, the juice of which leaves a deep stain. The cup in which they are borne partakes of the colour of the fruit. Its range is all over the Islands and Mainland, on the lower lands, as well as on the high mountains, usually amongst other shrubs.

HIGH BUSH-CRANBERRY; ARROWWOOD; MOOSEBERRY.

Viburnum Opulus,† Linn.

This is not really a Cranberry as the first English name would lead one to suppose, but is quite a high shrub belonging to the same order as the Honeysuckle and Snowberry. It often attains a height of 8 or 10 feet, but usually about 5 to 7 feet. The leaves, rounding at the base, are three-parted, each lobe ending in an acute point and the whole coarsely toothed, except the base, which is entire. The flowers, in corymbose clusters and borne at the ends of the branches, are white in colour, with both sexes in the same cluster like some of the Hydrangeas, and, like them, the male flowers only showing white petals. The berries, of a bright transparent red when ripe, about the size of a pea, have large flat seeds and are intensely acid until touched by frost. They are edible and make excellent jelly. Its range is general throughout the Upper Mainland in damp woods and along streams.

FEW-FLOWERED HIGH BUSH-CRANBERRY.

Viburnum pauciflorum,‡ Raf.

This resembles the High Bush-cranberry in many respects and is about the same in size. The mature leaves are nearly round in outline, indistinctly three-lobed and irregularly serrate, whilst the terminal leaves are often pointed and not lobed. The flowers, as the name indicates, are not as numerous as those of its congener; they are also much smaller and are not borne at the ends of the branches, but along the stem between two leaves. The fruit is very much like that of the other, but is said to be more palatable and matures earlier. Its habitat is cold damp woods, and its range throughout the northern part of the Province, the Mainland Coast, and parts of Vancouver Island.

RED-BERRIED ELDER.

Sambucus racemosa,§ Linn.

A shrub from 5 to 15 feet high or even more, growing usually in thick clumps. The young wood has a very large pith which disappears in a great measure in the old wood. It has compound leaves, formed of six or seven leaflets which are distinctly serrated and ending with a sharp point. The flowers, in large cymes,

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* *Having a circle of bracts surrounding the flowers.*

† *Opulus; the old Latin name for some tree, possibly this species.*

‡ *Few-flowered.* § *In racemes; the cymes are pyramidal and so raceme-like.*

are a yellowish-white, and the fruit a beautiful bright red which, combined with the brilliant green foliage, tends to give this plant a most attractive appearance and makes it well worthy of cultivation. Its range is quite extensive throughout the Province, and its habitat low rich bottoms.

Sambucus glauca: in fruit.

BLUE-BERRIED ELDER.

*Sambucus glauca,** Nutt.

This variety frequently grows to a larger size than *S. racemosus,* otherwise the characteristics are very similar, except that the fruit, which is blue-black covered with a whitish-blue bloom, is not at all bad to the taste, and good for wine-making. A peculiarity, by which I have usually been able to distinguish this variety, is that one side of the leaflet does not start at the same point on the petiole as the other. This peculiarity, however, is not implicitly to be relied

* *Covered with whitish bloom.*

upon, as it occasionally, although rarely, occurs in a modified form on the other. Since the above was written I have seen specimens at Nanaimo which are veritable trees; trunks 15 to 18 inches in diameter, 20 to 25 feet high, and with a spread of 15 to 20 feet.

BLACK-BERRIED ELDER.

*Sambucus melanocarpa,** Gray.

This variety is confined in its range, as far as I am aware, to the mountains of the Mainland interior, not having been recorded anywhere to the westward of the Coast Range. It is a smaller shrub than either of the other two species; seldom exceeding 7 or 8 feet in height. Its characteristics in all respects very closely resemble those of *S. glauca,* except that the berries are a bright black without any bloom.

ERICACEÆ.

TALL RED WHORTLEBERRY; WINEBERRY.

Vaccinium parvifolium,† Smith.

This beautiful shrub is from 6 to 10 feet high. The leaves are a bright green and, as the botanical name indicates, are small, being from ¾ to 1¼ inches long, in the young seedlings often nearly round and sharply serrated. In mature individuals they are ovate with a blunt point and without the serrations of the young leaves. The young leaves have the peculiarity of often remaining persistent throughout the winter.

The flowers, small and pink, appear before the leaves, all along the younger stems, which are distinctly angular to the touch. The fruit, about the size of a large currant, is a bright red with an agreeable flavour, rather acid until fully ripe, and most refreshing. Its range, in my experience, is confined to the Islands and the Mainland to the westward of the Coast Range, and its habitat damp coniferous woods.

HIGH BLUEBERRY.

Vaccinium alaskaensis.‡

This shrub, usually to be found in company with *V. parvifolium,* attains a height of from 6 to 12 feet. The leaves, a whitish-green, especially on the under-side, from 1 to 2½ inches long, are ovate in form, and almost entire, rarely slightly toothed. The fruit is blue-black with a slight bloom, agreeable to the taste, but without any distinguishing flavour. The range and habitat are the same as that of its red-berried companion alluded to above.

This Blueberry has been confounded with its near congener, *V. ovalifolium,* but it is really very different, both in the quality of the fruit, which is inferior to the latter, and in its habitat. A distinguishing feature is the recurved pedicel of the flower of *V. ovalifolium.*

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* *Black-fruited.* † *Small-leaved.* ‡ *Of Alaska.*

DWARF BLUEBERRY.

*Vaccinium cæspitosum** var. *cuniefolium.*†

This variety and that called *V. myrtillus* are the smallest of this numerous genus, variously known in the vernacular as Whortleberry, Blueberry, Bilberry, Blackberry, Huckleberry, Whinberry, and some other names. This variety seldom grows higher than 6 to 8 inches and, as its specific name indicates, grows in tufts. The leaf is usually from ½ to ¾ inch long, occasionally on vigorous young plants up to 1 inch, and finely serrated. It is designated "var. *cuniefolium*" on account of the wedge-shaped leaves, narrower at the base and gradually becoming wider towards the outer end. The flower, a pretty bell-shaped blossom, is of a pink colour and borne towards the ends of the stems just below the new growth of leaves at the extreme end. The fruit is small, blue, with a white bloom, and exceedingly pleasant to the taste. Its range is all over the Province in the lower sections down to sea-level, and its habitat open lands.

CANADA BLUEBERRY.

Vaccinium canadense,‡ Kalm.

I call this species by the common name given above, as I believe it to be identical with the variety known as such in the East. It attains a height of about 12 inches and the stems and leaves are thickly covered with fine down. The leaves, from 1 to 1¼ inches long, closely attached to the stem, are quite pointed at both ends. The flowers are a very light pink, borne in clusters near the ends of the stems. The fruit, a fine large berry, is dark blue with a slight bloom. I have found it only on the dry gravelly slopes at Nakusp on the Upper Arrow Lake, but I believe it occurs in other similar situations in the Interior.

MOUNTAIN BLUEBERRY.

Vaccinium myrtilloides,§ Hook.; *Vaccinium membranaceum,*‖ *Dougl.*

This Blueberry is a shrub attaining a height of from 3 to 6 feet. The leaves, a dark green, from 1 to 2 inches long, rounding at the base and terminating in a somewhat acute point, are finely and regularly serrated, as the name indicates. The fruit, in my opinion the finest both for quality and size of our numerous Blueberries, is flattened at the calyx end, often ½ inch in diameter, of a glossy black without any bloom, and with a rich aromatic flavour. Its range is very extensive, being found all over Vancouver Island and the Mainland at altitudes of 5,000 feet and over.

TALL BLUEBERRY.

Vaccinium ovalifolium,¶ Smith.

A shrub somewhat smaller than *V. myrtilloides,* but usually occurring in company with that variety. Its height is usually from 2 to 4 feet. Its leaves are a lighter green and are thinner and shorter than its companion, the size being from ¾ to 1 inch long, of an ovate shape, bluntly pointed, and not perceptibly serrated. The flowers, of a light pink, are of a globular shape. The fruit, not so much flattened as in the other—in fact, quite spherical in shape—attached to the stem by a peculiar recurved pedicel, is blue and with a heavy white bloom.

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* *Tufted.* † *Wedge-shaped leaf.* ‡ *Canadian.*
§ *Myrtle-like; descriptive of the leaves.*
‖ *Thin and somewhat translucent; descriptive of the leaves.* ¶ *Elliptical-leaved.*

The flavour is inferior and it is not as sweet as the other. Its range is all over the Province on high mountains below snow-line.

EVERGREEN BLUEBERRY.

*Vaccinium ovatum,** Pursh.

This shrub, the only evergreen variety of this genus, grows ordinarily to a height of from 4 to 6 feet, but in favourable localities, such as the west coast of Vancouver Island, it, in company with the Salal, attains an enormous growth, forming impenetrable thickets. The leaf, ¾ to 1¼ inches in length, attached by a very short petiole to the stem, which is thickly covered with woolly hairs, is somewhat rounding at the base, terminating in an acute point, and is thick, rigid, and sharply serrated.

The flowers, borne in clusters along and at the ends of the stems, are of a pretty pink or light-red colour and bell-shaped. The fruit is small, of a glossy black colour, and very pleasant to the taste. It is known amongst the natives, on account of its shape and size, as *Shot Oolalie*—i.e., Shotberry. Coming on late in the season, it is a useful berry and is extensively sold in the markets. Its range is on the Gulf Islands and Vancouver Island near the sea in restricted areas, except on the west coast, where it occurs in great quantities.

MARSH BLUEBERRY.

Vaccinium occidentale,† Gray.

This is a small shrub which occurs in marshy lands at the estuaries of rivers and in swamps, but, as I have not a specimen before me, I am unable to give an accurate description of it. The fruit is large and luscious, but flavourless and slightly bitter and astringent; one of the least agreeable to the taste of any of this genus. It is to be found on Lulu Island and in some of the swamps in the interior of Vancouver Island.

CREEPING RED WHORTLEBERRY; COWBERRY.

Vaccinium Vitis-idæa,‡ L.

This insignificant member of the genus has small ovate leaves about ½ inch long, borne on trailing stems. The fruit is red and quite large but not agreeable to the taste. In general appearance this plant resembles what is known as Kinnikinick (*Arctostaphylos Uva-ursi*). It is found on the slopes of the Rocky and Selkirk Mountains.

DWARF RED WHORTLEBERRY.

Vaccinium myrtillus§ var. *microphyllum,*|| Hook.; *Vaccinium scoparium,*¶ Leiberg.

This variety shares the distinction, in company with *V. cæspitosum,* of being the smallest of this family, its size being from 4 to 8 inches only in height. The leaves, ¼ to ½ inch long, are a very bright green with inconspicuous serrations. The fruit is a bright red, very small, but with a most agreeable odour and flavour. Its range, in my experience, is confined to the Selkirks and Rockies at an altitude of 5,000 feet and over.

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* *Egg-shaped; the shape of the leaf.* † *Western.*
‡ *Vine of Mount Ida (in Greece); an old name of classic origin.*
§ *Small Myrtle; referring to the leaves.* || *Small-leaved.*
¶ *Broom-like; the numerous erect branches give it this appearance.*

ARBUTUS; MADRONA.

*Arbutus Menziesii,** Pursh.

This is quite a common tree in the southern part of Vancouver Island, on the Gulf Islands, and on some parts of the coast-line of the Mainland. It is a

Arbutus Menziesii: a, fruit.

striking-looking tree with its red outer bark or rind and evergreen leaves, very ornamental for large grounds. There is a popular belief that this tree sheds its bark instead of its leaves; this arises from the fact that the red outer bark

* *Menzies'; after Alexander Menzies, a Scottish botanist and early visitor to the North-west Coast.*

peels off periodically in thin papery layers. The real bark is quite a quarter of an inch thick on large trees and of a leathery consistency. As a rule it does not attain a great size, growing as it does on exposed rocks and headlands, but trees a foot in diameter are common, although usually twisted and crooked. When growing in forests, however, it grows fairly straight and sometimes attains a

Arbutus at Quarantine Station, William Head, V.I.; circumference of trunk 5 feet from ground 11.6 feet. Photo. Harold Fleming.

large size, from 50 to 90 feet high.* On the Alberni Road, in the vicinity of Nanoose Bay, many fine specimens are to be seen. When travelling in company with the late Dr. Fletcher and the late Rev. J. W. Taylor some years ago,

*(NOTE.—*Some very large specimens are to be seen at the Quarantine Station, William Head, near Victoria.*)

I took the measurement of one tree, which was 10 feet 5 inches in circumference. The laurel-shaped leaves of this tree are a beautiful glossy green on the upper side and whitish-green on the lower, from 4 to 6 inches long, and remaining on the tree for two years, so that there is a constant succession of new leaves. On mature trees the leaves, I have observed, are usually in nines at the ends of the branchlets; I give this for what it is worth. The flowers, borne in dense compound racemes, are yellowish-white and bell-shaped, about ¼ inch across, with a strong odour of honey, which they evidently produce in large quantities to judge from the number of bees which frequent the trees when in bloom. The fruit, of a beautiful red, somewhat roughened on the surface, resembling small strawberries and up to ½ inch in diameter, is greatly relished by grouse and other birds in the autumn. I am not aware that the wood has been put to any particular use, but it is hard, fine, and close-grained, and takes a good polish. It is apt to warp and check if used before being well seasoned. By the natives it is used for gambling-sticks and gambling-rollers, the latter having the form of disks some 2 inches in diameter.

MANZANITA.

*Arctostaphylos tomentosa,** Dougl.

This has no common distinctive name. Manzanita, however, is a recognized name for the genus, especially of its taller members, and as this is the only one in this Province that exceeds the height of a low shrub the name Manzanita may well be attached to it.

It resembles the Arbutus in many respects, being, in fact, closely related to it. Its habitat is the dry rocky hillsides of Vancouver Island. It is seldom larger in the trunk than 2 inches, 3 inches being exceptional. It grows in a contorted form from 2 to 6 feet high and in dense clumps. The leaves and branchlets are very tomentose; that is, covered with fine woolly hairs. The colour of the leaves is a greyish-green and the size from 1 to 2 inches long and about 1 inch wide. The flowers are bell-shaped and pinkish-white, coming out before the leaves; in fact, during the late winter or very early spring. The fruit, which is borne sparingly, is about the size of a pea, flattened at the calyx end, and of a red or orange-red colour. The stems, very much twisted and crooked, are very smooth, of a dark-red colour, and eminently suited for rustic-work. Like its congener, it is an evergreen.

KINNIKINICK; BEARBERRY.

Arctostaphylos Uva-ursi,† Spreng.

This pretty trailing evergreen shrub has dark glossy green leaves, about the size and shape of those of the ordinary cultivated Box. The flowers are pink and bell-shaped, and the fruit, which is about the size of a large black currant, is bright red and very dry and mealy. It is quite sweet and full of large seeds, forming a favourite winter food for grouse and other birds. The natives use the leaves dried and mixed with tobacco for smoking. The stems are of a dull-red colour. The range is very great, extending quite across the Continent, and its habitat poor barren soils.

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* *Covered with matted hairs.*

† *Bears' grapes; probably from fondness of bears for the berries.*

LARGER BEARBERRY.

*Arctostaphylos media,** Greene.

This small shrub is seemingly a natural cross between the last two species. It was first reported by Professor Piper, of the Washington Agricultural College, and independently by myself. It resembles *A. tomentosa,* but is not so large a plant, being only from 1 to 2 feet high. The leaves are also smaller, but not tomentose, and of a brighter green.

WHITE RHODODENDRON.

Rhododendron albiflorum,† Hook.

The White Rhododendron is an alpine shrub from 3 to 6 feet high, having beautiful lemon-white flowers with slightly green centres, bearing a resemblance to cherry-blossoms. They are borne in clusters, usually at the ends of the branches, and sometimes along the stems in the axils of the leaves. They have an agreeable odour like that of bitter almonds. The deciduous leaves, from 1 to 2 inches long and half as broad, occur in bunches of seven to ten, often overshadowing the flowers. It is common on high mountains at altitudes of 5,000 to 7,000 feet all over the Province.

EVERGREEN RHODODENDRON.

Rhododendron californicum,‡ Hook.

This species resembles the cultivated kinds in the shape of its leaves and flowers. The evergreen leaves are from 3 to 6 inches long, of an oblong shape, and dark green. The flowers are a beautiful pink or rose, in large bunches at the terminal points of the branches. The height is from 3 to 8 feet, and it is found on the mountains near Hope and probably elsewhere in the Province; quite plentifully at Port Townsend and Whidby Island, in the State of Washington.

FALSE AZALEA.

Menziesia ferruginea,§ Smith.

This shrub grows from 2 to 5 feet high. The young shoots are of a reddish colour; hence the specific name. The leaves, from 1 to 2 inches long, are narrow and pointed and of a delicate green. The bell-shaped flowers are borne singly along the stem, of a brick-red colour, and about ¼ inch long. Common on the west coast of the Island and on the mountains of the Island and the Mainland, in damp woods.

COPPER BUSH.

Cladothamnus pyrolæflorus,‖ Bong.

It is usually about 4 feet in height, with narrow, rather thick, pale-green leaves, from 1 to 2 inches long, the edges quite smooth, thickly covering the branches. The flowers are inconspicuous, but quite pretty, of a yellowish-red colour, and occur usually in pairs at the ends of the branches.

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* *Middle.* † *White-flowered.* ‡ *Californian.* § *Of the colour of iron-rust.*
‖ *Pyrola-flowered; the connection is obscure.*

The seed-vessels are hard and round, quite small, dividing at the upper end into five when mature. Its range is general in the mountains of Vancouver Island and the Mainland, in damp woods.

SALAL.

*Gaultheria shallon,** Pursh.

The Salal is an evergreen shrub all the way from 1 to 12 feet in height, according to locality, the average about 3 feet. Usually it grows in dense masses, and on the west of Vancouver Island, where it attains its greatest size, forms impenetrable thickets. The leaves, a bright green, are from 2 to 4 and even 5 inches in length, ovate in shape, 2 to 3 inches broad, round at the base, often slightly cordate or heart-shaped, and terminating in an acute point. The flowers, bell-shaped and pinkish-white in colour and borne in racemes at the ends of the branches, are very pretty and quite sticky to the touch. The fruit is dark purple, nearly black, with an open calyx when ripe. It is about the size of a Haw, but longer.

This is one of the best of our wild fruits, being sweet and juicy, with minute seeds. It is quite an article of food with the natives, who preserve it by drying in cakes for winter use. Its range is confined to that portion of the Mainland to the westward of the Coast Range, and the Islands, in fir forests.

DWARF SALAL.

Gaultheria myrsinites,† Hook.

A small prostrate evergreen, rarely more than 4 inches high. The leaves, from ½ to 1 inch long, bright green, are borne along the stems, concealing the flowers and fruit. The flowers are white and bell-shaped and the fruit small and of a dark-red colour. It is common on high mountains all over the Province.

AMERICAN LAUREL.

Kalmia glauca,‡ Ait.; *Kalmia polifolia,§* Wang.

A swamp-shrub from 1 to 2 feet high. The leaves are smooth, bright green above and whitish underneath, from ½ to 1 inch long, narrow and pointed. The flowers, which are very beautiful and of varying shades of pink, are borne at the terminals of the stems in corymbose umbels. Its range is widespread throughout the Province, in swamps and marshy localities.

LABRADOR TEA.

Ledum glandulosum,‖ Nutt.

A marsh-plant from 2 to 4 feet high. The leaves, from 1½ to 2 inches long and quite narrow, are of a greyish-green above with rusty-brown woolly hairs underneath, the edges turning down, the leaf thus presenting a rounding appear-

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* *A variation of Salal.* † *An old Greek plant-name, with no special significance here.*
‡ *Covered with whitish bloom.* § *Polium-leaved; referring to the white bloom on the under-side of the leaves.* ‖ *Glandular; referring to the glands beneath the leaves.*

ance from above. It has an agreeable odour when crushed and is reputed to make a good substitute for tea. The flowers are white, about ¼ inch across, and are borne in umbels at the ends of the stems. Common in swamps all over the Province.

BROAD-LEAVED LABRADOR TEA.

Ledum latifolium,* Ait.; *Ledum grœnlandicum*,† Oeder.

A plant similar in all respects to the other, save that the leaves are not woolly underneath. Found in swamps, but not as common as the other variety.

ELÆAGNACEÆ.

SOAPBERRY; BRUE.

Shepherdia canadensis,‡ Nutt.

This is one of the two representatives of the natural order Elæagnaceæ (which is allied to the Olive family) in this Province. It is a shrub from 3 to 10 feet high. The leaves, from 1 to 2 inches long and half as wide, pointed and quite smooth on the edges and of a dull-green colour, are covered on the under-sides, in common with the young branches or twigs, with shiny reddish specks, giving them a distinctly rusty-red appearance when viewed from underneath.

The flowers appear very early in the spring, before the leaves, and are of a dull-red colour, very small, and borne in clusters, usually two clusters at the end of a short stem, divided by a small leaflet or bract and with two leaves at the extremity. The buds form in the summer previous and may be seen at any time in the shape of small reddish globules. The fruit is usually red, sometimes orange in colour, resembling a red currant in size, but more elongated. It has the peculiar quality of being sweet, acid, bitter, and aromatic. This peculiarity renders it objectionable to some, but very agreeable to many. The juice, when beaten up, forms a beautiful salmon-coloured froth, which when mixed with sugar is greatly esteemed by the natives, and by whites who have acquired a taste for it. It is from this peculiarity that it obtains the name of Soapberry or Soap Oolalie, in the Chinook jargon. The range of this shrub is very wide, inasmuch as it is to be found in all parts of the Province where suitable conditions exist. Its habitat is the hilly and mountainous parts of the Province, usually in rather open situations, and on dry soil. It is common in the vicinity of Victoria and on the Saanich Arm, and very abundant in the Rocky Mountains.

BUFFALO-BERRY; SILVERBERRY.

Shepherdia argentea,§ Nutt.; *Elæagnus argentea*, Pursh.

This is the other representative of the family in this Province referred to under the preceding one. It is a shrub from 3 to 10 feet high, usually growing in clumps or thickets. It is probably the most easily identified plant in the Province, inasmuch as it is (as its name indicates) of a silvery white, including the stems, leaves, and fruit, all covered with glistening silvery specks.

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* *Broad-leaved.* † *Of Greenland.* ‡ *Canadian.* § *Silvery.*

The leaves resemble, in size and shape, those of the other. The fruit is about the size of a large black currant, but more elongated, and full of large seeds. It is sweet but dry, and, although edible, is of no economic value. A peculiarity I have observed in this shrub is that the roots have nodules resembling those on leguminous plants. Its range is confined to the Dry Belt of the Interior, along streams and coulees in dry sandy soil. It is well worth cultivating as an ornamental shrub.

MYRICACEÆ.

SWEET GALE.

*Myrica gale,** Linn.

A shrub 4 feet high and over, with sweet-scented leaves, of a dull-green colour, somewhat whitish underneath, slightly serrated and resembling a rose-leaf. The stems have a smooth dark-red bark. The flowers, or rather catkins, which appear before the leaves, are small, greenish, and inconspicuous, borne in small bunches at the ends of the branches. The fruit afterwards appears in the shape of small cones.

It is common on margins of lakes, where the roots are immersed in water during part of the season. The appearance of this plant is very similar to that of the pink-flowered Spiræa (*S. Douglasii*), when both are out of bloom, and occurring as it does in similar localities is easily mistaken for it unless closely examined.

CUPULIFERÆ.

WESTERN OR RED ALDER.

Alnus oregona,† Nutt.; *Alnus rubra,*‡ Bong.

It is so called on account of the sap, which turns to a dull red when exposed to the air, and is therefore used by the natives as a dye for basket-work, mats, etc. The habitat of this tree is the low rich valleys, where it generally grows in extensive groves, attaining a size of from 10 inches to 3 and even 4 feet at the base, and a height of 50 to 100 feet. The bark is whitish on the outside, smooth on the younger trees, and roughened, often with wart-like excrescences, on the older individuals. The range is principally along the seaboard of the Mainland and the Islands. The leaves are a dark green, often whitish on the under-side, especially on the young trees, coarsely toothed, usually from 3 to 4 inches in length, but much larger on young vigorous trees. They are oval in shape and fall on the approach of winter without turning colour.

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* *A Myrtle-bush (Anglo-Saxon); from supposed resemblance.* † *Oregon.* ‡ *Red.*

Like some other trees of this family, it bears staminate and pistillate flowers separately, the former in the shape of what are popularly known as catkins, which emit quantities of yellow pollen in the spring. The cones, borne in clusters, are of a dark-brown colour from ½ to ¾ inch long, and remain persistent during

Alnus oregona: a, seed.

the following winter and often until late in the spring. The wood, which is of a light-brownish colour, nearly white, resembles black walnut in grain and is used, stained to the proper shade, in imitation of that wood, for furniture, inside finishings, banisters, etc. The natives use this wood, which is easily worked, for

various purposes of domestic economy, spoons, dishes, boxes, and furniture such as they require; and the inner bark, as before mentioned, as a dye.

Red Alder trunks. Photo. Forestry Dept.

SITKA ALDER.

*Alnus sitchensis,** Regel.

This Alder is a small insignificant tree, or shrub, from 6 to 15 feet high, according to locality, and 2 to 5 inches in diameter, usually growing along water-courses on the steep sides of high mountains, often taking the place of larger trees which have been destroyed by avalanches, but occurring sometimes on the lower lands on margins of lakes; for instance, about Shawnigan Lake. It seldom or never grows straight, but usually in a contorted form, especially when growing in localities where snow lies deep and avalanches occur. In such situations, alternately bent almost to the ground by the snow and pointing downhill, and then growing up, wet and slippery again, it forms most exasperating thickets through which to force a passage.

* *Belonging to Sitka.*

The wood is soft and pliable and the tree is well adapted to withstand the rough treatment of alpine regions. The leaf is a bright glossy green, irregularly and finely double-serrated, covered with an aromatic gummy substance, which extends to the stems. Like the other Alder, it bears catkins, but longer and

Alnus sitchensis: a, seed, natural size and enlarged.

more graceful, being from 4 to 5 inches in length. The cones are also somewhat larger and are borne in clusters. The wood is worthless and is only used for fires where no better is to be obtained. Its range is all over the Province, on high mountain-sides, and other localities where the conditions are favourable.

WESTERN BIRCH.

*Betula occidentalis,** Hook.

There is some confusion as to the proper designation of our large Western variety. Its range is principally on the Mainland, some few specimens occurring in scattered localities on Vancouver Island. In some places it grows to quite a large tree, 2 to 3 feet through, but often it does not attain a larger size than 8 to 10 inches, the height varying from 20 to 80 feet or over. The leaves, from

* *Western.*

Betula occidentalis: a, fruiting twig; *b,* cone scale; *c,* seed, natural size and enlarged.

2 to 4 inches in length and nearly as wide, irregularly serrated with a sharp-pointed end, and of a deep-green colour, tend to give the tree a very pleasing appearance. It is well worth the trouble of cultivation in ornamental grounds. The young stems and leaves are glossy, with an exudation which renders them distinctly sticky. The cones, or more properly aments, of which there are as usual with this class both staminate and pistillate, are some 2 inches in length, the latter becoming brown when mature.

The outer bark is silvery white, and when peeled comes off in layers round the tree, not longitudinally, leaving the inside a dull greenish-yellow. Birch-bark is used by the natives for various purposes, principally for baskets and ornamental work. After the introduction of the birch-bark canoe by the Hudson's Bay Company's officers the Indians began to use it for that purpose also. Curiously enough, C. S. Boulger, in his work entitled "Familiar Trees," says: "Its silver rind formed the canoes of our early British ancestors, such as have been found buried in the gravels of the banks of the Clyde." It is most useful for kindling fires also, burning with great freedom. The wood is white and dense, but it has not been used for any particular purpose, except for fire-wood. After the tree dies the wood soon decays. A certain Dean of Wells, writing of the uses of birch in 1568, says: "I have not read of any virtues it hath in physic; howbeit, it serveth for many good uses, and none better than for beating of stubborn boys, that either lie, or will not learn." Shakespeare, in "Measure for Measure," alludes to the birch as follows:—

> Having bound up the threatening twigs of birch,
> Only to stick it in their children's sight,
> For terror, not for use; in time the rod
> Becomes more mocked than feared.

MOUNTAIN BIRCH; BROWN-BARKED BIRCH.

*Betula fontinalis,** Sarg.

It occurs on the margins of ponds and lakes on the Upper Mainland. It is by no means as large a tree as the other, being usually only from 4 to 6 inches in diameter, from 15 to 30 feet high, and of a crooked form of growth. The bark is of a deep reddish-brown colour, the leaves are smaller, roundish, and serrated. The fruiting aments also are smaller.

LOW BIRCH.

Betula pumila,† Linn.; *B. glandulosa,*‡ Michx.

This is a mere bush occurring in bogs and swamps, in some parts of the Mainland and on Vancouver Island. It is usually from 4 to 8 feet high and 1 or 2 inches in diameter. The leaves are about 1 inch long and nearly round. The bark is a deep brown.

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* *Of a spring or fountain; referring to its moist habitat.* † *Dwarf.*

‡ *Glandular; referring to the resin glands on the leaves.*

Betula fontinalis: a, fruiting twig; *b,* seed, twice natural size; *c,* cone scale, twice natural size.

WESTERN WHITE OAK.

*Quercus Garryana,** Hook.

Considerable discussion and diversity of opinion has been expressed regarding this Oak, as to whether our variety is not distinct from that of Oregon and Washington, and whether or not we have more than one variety. I am of opinion that any peculiarities are due to local conditions, and that we have only

* *Garry's; after Nicholas Garry, an officer of the Hudson's Bay Company.*

one, and that it is the same as that found in the adjoining States. In any case, for a work of this character, designed as it is for popular use as a means of identification, it will suffice to adopt the opinion given. The range of this tree is altogether confined in this Province to Vancouver Island and the Gulf Islands, not a single specimen, in my experience, occurring on the Mainland. It appears in the adjacent States of Oregon and Washington, however, extending even into California. Patches of it occur on the southern end of Vancouver Island and for about 150 miles north. In some places it attains a size of from 3 to 4 feet in diameter, with good straight trunks, from which logs can be obtained from 10 to 20 feet in length. The wood resembles English Oak in appearance, having

Garry Oaks, Victoria. Photo. Harold Fleming.

a beautiful grain, but it has never been much used commercially, principally, I believe, on account of the difficulty of seasoning it properly. It is used in a limited degree by cabinetmakers for ornamental furniture, boat-builders for knees, etc., and for other purposes of a similar description. The bark, a whitish-grey in appearance, is deeply scored in the older trees, affording excellent shelter for the eggs of the Oak-tree Looper, which occasionally devastates the Oak forests in the vicinity of Victoria.

The leaf, a dark glossy green on the upper side, is somewhat lighter on the under-side, where also it is usually covered with downy hairs; it bears a considerable resemblance to that of the English Oak, but is thicker. The size is

from 2½ to 3½ inches long and 2 inches wide on mature trees, the lobes deeply cut with rounding edges. The acorns are borne usually in couples, sometimes in threes, opposite to each other, and closely adhere to the branch. They are used as an article of food by the natives farther south.

BEAKED HAZELNUT.

*Corylus rostrata** var. *californica,*† A. DC.

A shrub from 3 to 10 feet high. Like other nut-trees of this description, it has the two kinds of flowers, the male or staminate appearing in the form of catkins, and the pistillate small and inconspicuous, appearing early in the spring, before the leaves. The leaves are from 2 to 3 inches long, nearly as broad, and quite hairy to the touch. The nuts are usually borne in couples, encased in a thick green coating containing an acid juice, and the whole covered with bristly stiff hairs, which stick into the fingers when the nuts are handled.

The term *rostrata,* or beaked, is applied on account of the long beak-like termination of the casing alluded to. It is common throughout the Province, on low hillsides and in open woods, frequently on dry gravelly soils.

SALICACEÆ.

BLACK COTTONWOOD.

Populus trichocarpa,‡ T. & G.

The common name is given on account of the cottony material which carries the seed. This is a common tree throughout the Province on low-lying lands in the vicinity of water. It attains a large size in favourable localities, 3 to 5 feet in diameter being common, with a height of 75 to 150 feet. The wood is but little used, being soft and without any great qualities to recommend it. The principal uses it has been put to are the manufacture of "excelsior," for which purpose it is well adapted, and of barrels. It has also been used to a limited extent for boxes, but the objection to its use for this purpose, I am informed, is that it turns dark after being sawed. Possibly this difficulty could be overcome by allowing the wood to season in the log, or by other methods. It is also said to be useful in making excellent pulp for paper and the natives use it, when better wood is not obtainable, for making canoes.

The leaves, which are somewhat cordate, or heart-shaped, are broad at the base, tapering to a point, and attain a large size on young trees, from 10 to 11 inches long and 7 inches broad. They are bright green on the upper sides and white on the under-sides. When shaken by the wind they give a very curious appearance and suggest a white-flowered tree. On older trees the leaves are much smaller. In the autumn the leaves turn to a dull-yellow colour. Growing in the open, this is a handsome tree, much more so than the stiff-growing Lombardy Poplar, which is so frequently planted in ornamental grounds.

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* *Beaked.* † *Californian.* ‡ *Hairy-fruited; descriptive of the fruit.*

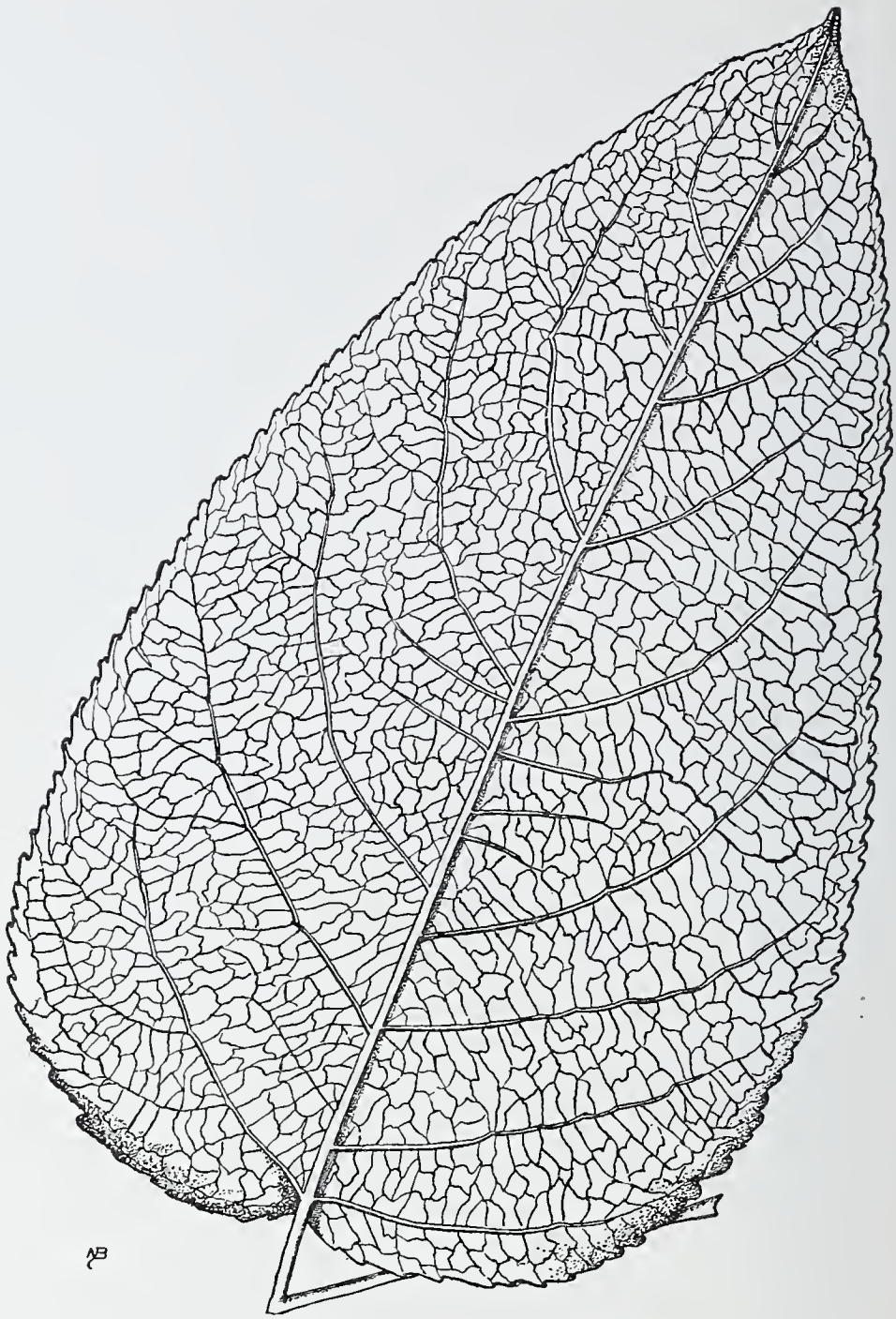
Populus trichocarpa.

ASPEN; ASPEN-LEAVED POPLAR.

*Populus tremuloides,** Michx.

P. tremuloides is so called on account of the tremulous effect of the leaves when agitated by the least breath of air. I know of no more pleasant sound than the rustle of these leaves, when, after crossing a hot treeless prairie, one finds oneself by the side of a stream shaded by this beautiful tree. It probably

* *Like* tremula *(quivering, trembling); specific name of corresponding European Aspen.*



Populus trichocarpa: leaf of vigorous shoot.

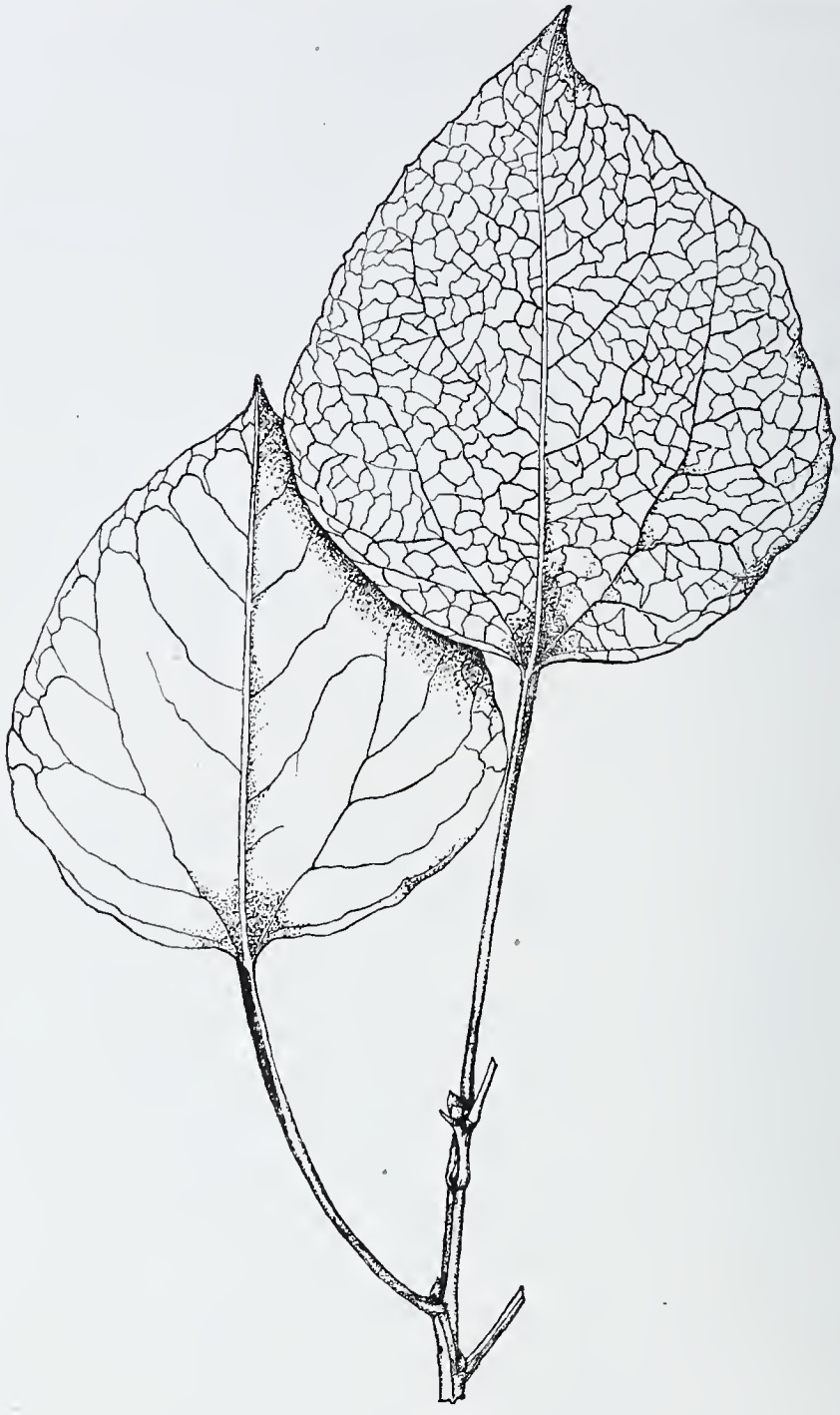
is more wide in its distribution in America than any other tree, occurring as it does from the Atlantic to the Pacific, and forming the principal source of wood-supply in the Prairie Provinces, where the groves or forests are designated as "bluffs." In some parts of our Province also it constitutes the principal wood for fences and fires. The bark is smooth and greenish-white, except at the base of old trees where it is roughened by shallow scores.

The leaves, nearly round and slightly pointed, are commonly from 1½ to 2½ inches in breadth, and somewhat longer, exclusive of the pointed end, but much larger in young and vigorous trees. The wood is soft and decays quickly. Even in its green state, however, it makes excellent firewood. Its favourite

Trunk of Black Cottonwood, Skeena River, near Terrace. Photo. Forestry Dept.

Group of Cottonwood trees, border of Cariboo Lake, Fort George F.D. Photo. Forestry Dept.

habitat is usually on the margins of streams and low-lying land, but it also occurs on the mountains and hillsides in damp spots, both on the Mainland and Islands. It usually attains a diameter of 6 to 12 inches, but often larger, and from 20 to 75 or 100 feet high in this Province. The catkins, or aments, are about 2 inches long, covered with brown silky hairs, giving them the appearance of



Populus tremuloides.

large caterpillars. The sap layer, which is stripped from the wood in the spring, after the removal of the bark, by means of a bone implement made from the rib-bone of a deer, is quite sweet and of rather a pleasant flavour, and is used by the natives as an article of food. These ribbon-like strips are sometimes laid crosswise on each other, dried in the sun, and so kept for future use.

Known botanically under the generic name of "*Salix*," the Willows constitute a genus which has not been, so far, well worked out, and, as their numbers are legion, I shall confine myself to a few of the best-known varieties only.

HOOKER'S WILLOW.

*Salix Hookeriana,** Barratt.

This is the largest of our Willows, although perhaps not so tall as some others. It often attains a height of 20 to 30 feet or more and from 1 to 2 feet

* *Hooker's.*

Salix Hookeriana.

at the base, dividing a short distance from the ground, with many stems or branches. The leaves, from 2 to 4 inches long, broad and rounding towards the upper ends, which terminate in a slight point, are a light green and densely covered underneath with a white down. The catkins, or aments, appear before the leaves (in January at Victoria). They are short and woolly white and silky at first, and turning to a yellow as they develop. When mature they are from 2 to 3 inches long, with masses of white down by means of which the seed is conveyed. Ubiquitous, on dry, as well as wet, lands, both on the Island and the Mainland.

LARGE-SEEDED WILLOW.

*Salix macrocarpa,** Nutt.

A shrub about 10 feet high, with small leaves 1 to 1⅜ inches long and ⅜ inch wide, bluntly pointed. Catkins, borne along the stems, are from 1 to 1½ inches long, with prominently large seed-pods, which later burst and develop a large quantity of down. It is found along river-banks on Vancouver Island.

WESTERN BLACK WILLOW; BRITISH COLUMBIA WILLOW.

Salix lasiandra,† Benth.

A tree 10 to 20 feet high, or even more, with sharply pointed leaves up to 6 inches in length and 2 inches wide. Aments, about 2 inches long, appear simultaneously with the leaves, turning to a bright yellow as they approach their full size, and later developing masses of beautiful white silky down. Found near and in water on the Islands and the Lower Mainland. Another Willow resembling the above in all respects, save that the leaves are distinctly serrate and the catkins with less silky down, is common all over the Province near water.

LONG-LEAVED WILLOW.

Salix longifolia,‡ Muhl.

A slender shrub from 5 to 15 feet high with long narrow leaves, 2 to 3 inches in length, of a silvery-grey green, the under-sides covered with a white down when young, which disappears in a great measure at maturity. The mature catkins or aments are about 2 inches long and only sparingly provided with the usual silky down common to this class of plant. Its range is all over the Interior Mainland, on sand-bars and river-bottoms. A most graceful and interesting Willow, well worthy of cultivation.

GLAUCOUS WILLOW.

Salix glauca,§ Linn.

A shrub from 5 to 10 feet high, leaves 2 to 2½ inches long, pointed, light green on the upper side and lighter on the lower. Catkins borne along the stem, 2 to 3 inches long, not very downy. Along watercourses in mountains.

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* *Large-fruited.* † *Hairy-anthered; referring to the hairs on the filaments which bear the anthers.* ‡ *Long-leaved.* § *Covered with bloom.*

Salix lasiandra.

FLAVESCENT WILLOW.

*Salix flavescens,** Nutt.

A shrub 10 to 12 feet high with narrow pointed leaves, quite lanceolate, 2 to 3 inches long and ⅜ inch wide, finely serrated, deep green above, lighter underneath. Catkins small, about 1 inch long. Near water on low lands, on the Islands and Lower Mainland.

PRAIRIE WILLOW.

Salix desertorum,† Rich.; *Salix brachycarpa,‡* Nutt.

A low-growing shrub with small narrow leaves, not more than 1 inch long and ¼ inch wide, bluntly pointed. Catkins 1 to 1½ inches long, becoming very woolly or cottony when mature. Near rivers and streams in high mountains.

DWARF WILLOW.

Salix reticulata§ var. *nivalis,*|| Ryd.; *Salix nivalis,*|| Hook.

This is the smallest of our Willows, being only an inch or so high, with small round or oval leaves. It is found on high mountains in open wet land near snow-line.

BARCLAY'S WILLOW.

Salix Barclayi,¶ Anders.

A small shrub with oval leaves, 1 to 2 inches long, very distinctly veined. Catkins, which are very woolly, come out with the leaves. It is found on high mountains in wet localities.

LOW WILLOW.

*Salix vestita,*** Pursh.

A low-growing shrub a foot or more high. The leaves have a curiously wrinkled appearance, from ¾ to 1 inch long, of an oval shape, rounded at both ends, dark green on the upper side, and covered with white silky hairs underneath.

The catkins, which are small, only an inch long, appear after the leaves at the ends of the stems, developing masses of white cotton when mature. It is found on high mountains throughout the Province in damp, open, rocky places.

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* *Becoming yellow; from the changing colour of the leaves.* † *Of waste places.*
‡ *Short-fruited.* § *Net-veined; referring to the leaves.* || *Snowy.*
¶ *Barclay's.* ** *Clothed, as here, with silky hairs.*

SITKA WILLOW.

*Salix sitchensis,** Sanson.

A shrub often almost attaining to the dignity of a tree. The leaves are narrow and pointed, from 2 to 3 inches long, bright green on upper side, and densely covered with very fine white woolly hairs on the under-side. The catkins

Salix sitchensis.

come out early in company with the leaves. They are then of small size, but about 2½ inches long when mature, and produce large quantities of cotton attached to the seed. It is common throughout the Province, along watercourses,

* *Belonging to Sitka.*

where its red fibrous rootlets are frequently to be seen under water, floating like seaweed.

Salix sitchensis.

ARCTIC WILLOW.

*Salix arctica** var. *petræa*† (R. Br.), Anders.

A low-growing shrub from 4 to 8 feet high, its leaves are from 1½ to 2½ inches long, narrow towards the petiole or leaf-stem and increasing in size upwards until they are from 1 to 2 inches wide, forming nearly a round end and slightly pointed, the edges quite smooth. The catkins are from 2½ to 3½ inches in length. Its range is general in the Province, on high mountains, in wet meadows close to melting snow.

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* *Arctic.* † *Rock-loving.*

FOOD-PLANTS AND NATIVE METHODS OF COOKING.

The variety of native food-plants used by the natives is no doubt much greater than is generally supposed, and in the following pages I have endeavoured to enumerate all that have come under my personal observation or from well-authenticated sources, and to give the methods of preparing them. My late father in one of his manuscripts (I shall hereafter refer to his writings as A. C. A. MS.) says:—

"Nature, ever a beneficent mistress, has scattered her favours with a lavish hand, and in doing so has directed the wandering aborigines to select, as it were instinctively, those roots and berries of her providing which are nutritious and wholesome, while rejecting with apparently unerring precision those which are deleterious and poisonous."

CAMAS.

*Camassia esculenta,** Lindl.; *C. quamash,*† Greene; and *Camassia Leichtlinii,*‡ Wats.

The bulbs of both of these species are equally edible. It is commonly called Camas or Le Camas and so the name has degenerated into Lickomas amongst those who are ignorant of the origin of the name. It is a bulbous plant, bearing a spike of beautiful blue flowers, from 6 to 12 inches in height, belonging to the Lily family. The bulb, which is about the size of a small Hyacinth, is a common article of food among the Indian tribes of North America. I am not aware of the limits of the territory in which it grows, but certainly in British Columbia, with which I am at present dealing, it is common everywhere where the land is sufficiently clear of trees and the soil rich enough, a rich black loam in open country being its natural habitat. The women go out when the plant is in bloom and with long, sharp, slightly curved and flattened, tough sticks dig up the bulbs, which are from 4 to 5 inches in the ground. These are conveyed to a kiln, 10 feet or less in diameter, and there cooked, after which the bulbs are divided among the contributors, who place them in baskets and store them away for future use. In a raw state the Camas is perfectly white, very glutinous, and somewhat sweet. After cooking it assumes a rich brown colour, quite sweet, with an aromatic and pleasant flavour. The kilns of which I speak are hollows in the ground from 2 to 3 feet in depth, the bottoms of which are filled with large stones, on which fires are built until the stones become red-hot. Grass is then placed on the stones, on the grass the Camas is heaped, and in turn covered over with grass and mats, and earth heaped over all. The Camas is allowed to remain in the kiln for several days or until it is quite cold, when, as I said before, the bulbs are divided up. This, before the use of iron utensils became known, was a very common mode of cooking. Besides Camas, other roots were cooked in the same way.

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* *Edible.* † *Another rendering of the Indian name.*
‡ *Leichtlin's; after Max Leichtlin, a German horticulturist.*

WILD ONION.

*Allium acuminatum,** Hook. (principally).

This is the common wild onion of this country which has light-pink flowers. Cooked in the manner described above, all flavour of the onion disappears, and like Camas it comes out a rich brown with a sweet syrup. In this state it can be kept for a long time.

TIGER-LILY.

Lilium columbianum,† Hanson.

The bulb is used in its fresh state and is cooked by boiling. It is slightly bitter and quite glutinous. I may here state that before metal utensils were obtainable boiling was done in baskets such as are even now to be seen commonly, constructed of the roots of the cedar, spruce, etc. These baskets are water-tight when in use for that purpose. To heat the water hot stones are placed in the baskets, this process being repeated until the food is cooked. On the sea-coast square boxes made of wood were also often used for the purpose.

"The Tiger-lily is found abundantly in the fertile bottoms and extends considerably to the north of Alexandria on the upper Fraser. Under the name of Tza-chin the natives of the latter place use the root as an article of food. Carefully steamed it is an excellent substitute for the potato, its flavour somewhat like that of a roasted chestnut, with a slight bitterness which renders it very agreeable."—A. C. A. MS.

FRITILLARY; RICE-ROOT; MISSION-BELL.

Fritillaria lanceolata,‡ Pursh; *F. kamtschatcensis,*§ Ker.; *F. pudica,*‖ Spreng.

The Fritillary whose roots I have seen most commonly eaten, *F. pudica,* Mission-bell, bears a beautiful yellow flower with a sweet perfume. The bulbs of the Fritillaries are very glutinous and have a slightly sweet taste. They are boiled in their fresh state.

FALSE SOLOMON'S SEAL.

Smilacina racemosa,¶ Desf.

This is a plant of the Lily family, common throughout the Province. It bears a raceme of creamy-white star-shaped flowers with a most agreeable odour. The berries, a bright red, are exceedingly sweet, but with a sickly flavour that renders them disagreeable. It is used rather sparingly.

MARIPOSA LILY.

*Calochortus macrocarpus,*** Dougl.

This is a plant belonging to the Lily family. Several species occur in California, whence its vernacular name is derived. This species bears a very

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* *Long-pointed; from the tapering bracts which enclose the inflorescence.*
† *Columbian.* ‡ *Lance-shaped; referring to the leaves.*
§ *Belonging to Kamtschatka.* ‖ *Bashful; from the drooping flower.*
¶ *Racemose; from the form of the inflorescence.* ** *Large-fruited.*

handsome flower, from light lavender to lilac in colour. The leaves appear in the early spring, the flower in summer after the disappearance of the leaves. The bulb, long in proportion to its size, is used in a cooked state for food. The plant grows on the open prairies of the Dry Belt.

WILD CLOVER.

Trifolium sp.

The roots are described as being very sweet and pleasant to the taste and are sometimes partially dried and smoked. A favourite way of using this root is to roll a number together and dip in oil—fish-oil, of course, by preference.

COW PARSNIP.

*Heracleum lanatum,** Michx.

This plant, called "Chou Creux" by the French-Canadians, belongs to the Umbelliferæ. The flower-stems are gathered before the flower opens, when they are easily peeled, and are eaten green. If left too late the stalks become woody. The leaf-stems are also eaten, but they have to be split open and stripped from the peel, generally with the teeth. This is not at all an unpleasant herb. It occurs all over British Columbia and the adjoining States. Sir Alexander Mackenzie, on his memorable journey of exploration to the Pacific Coast in 1793, frequently alludes to this plant under the name of "Wild Parsnip." He found it to be a most useful and acceptable vegetable in its cooked state as an adjunct to pemmican, his staple article of food. In one part of his narrative he says: "The Wild Parsnip, which luxuriates on the borders of the lakes and rivers, is a favourite food of the natives. They roast the tops of this plant in their tender state over the fire, and, taking off the outer rind, they have a very palatable food."

RAT-TAIL; LOVAGE.

Ligusticum scoticum,† L.

This was called "Queue de Rat" by the French-Canadians usually attached to the Hudson's Bay Company in bygone times. It is the root of a water-plant belonging to the Carrot family, Umbelliferæ. It so closely resembles the poisonous Water-hemlock, both in the appearance of the roots which resemble a bunch of rats' tails (hence the name) and in its peculiar odour, that great care is necessary in gathering them. It is used either in the raw state or cooked, and in both ways it is decidedly good, being sweet, with a pleasant aromatic flavour and very nutritious.

At Fort Alexandria on one occasion, when my father was in charge, the men were employed in cutting and curing swamp-hay for winter use. They had only been gone for half a day when they returned to the Fort, one man driving the cart, swaying about like a drunken man, the others lying in the bottom of the cart. His first words, addressing the father of a young lad, were: "Votre garcon est mort." It transpired that they had eaten poisonous hemlock by mistake. They were all in a serious condition, and had it not been for the energetic means used by my father they would certainly have died. As it was, they recovered, although the boy had a close call.

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* *Woolly; descriptive of the leaves.* † *Scottish.*

PIGNUT; WILD CARAWAY.

*Carum Gairdneri,** Gray.

This belongs to the same family as the last and is a common plant about Victoria and elsewhere. It grows from 1 to 2 feet high with a number of white flowers and bears one or more, commonly two, small corms, elongated in shape, which are quite palatable, being aromatic and sweet. They are used either raw or cooked. A United States authority says of it: " Under the name of ' Swamp ' the root is a common article of food among the Indians of Idaho and Wyoming; it is very palatable and nutritious."

WILD CELERY.

Lomatium utriculatum,† Nutt.

This is another plant belonging to the Umbelliferæ. In the very early spring, in fact as soon as the snow is off the ground, the young sprouts, before they appear above the ground, are sought for amongst the broken rocks on hill-sides which constitute the natural habitat of this plant. It is traced by the dead stems of the previous year. Among some of the natives it is called " Sweeya." It is a good imitation of the cultivated Celery, but becomes rather pungent as it grows older.

WATERLEAF.

Hydrophyllum sp.

The young stalks of a species of *Hydrophyllum* are used in the same manner as those of the Horse-tail and resemble them in quality and flavour.

WESTERN SERVICE-BERRY; SASKATOON; JUNE-BERRY.

Amelanchier alnifolia, Nuttall.

The Service-berry or June-berry, called Poire by the Franch-Canadians, it being in fact closely allied to the Pear, is called Saskatoon by the natives in the adjoining Provinces, and I have heard it alluded to as the Oolalie in this Province. Needless to say to those who know, Oolalie is the generic Chinook name for all berries. The variety in this Province is known botanically as *Amelanchier alnifolia,* that to the eastward of the Rockies as *A. canadensis.* They are practically identical, however, as regards the fruit, which is used fresh or dried, and is really one of the principal articles of food. It is used in the East, as well as in the West, in the manner stated, as an adjunct to pemmican.

Since pemmican is mentioned here, and elsewhere in this work, it is perhaps best to give an explanation of what it really is, although, as far as I am aware, it has never been manufactured as an article of food amongst the natives of this Province. Pemmican is made by pounding up dried flesh (buffalo-flesh, when these animals were still common), mixing it with berries, Service-berries and Choke-cherries principally, and consolidating this into one mass by the addition of melted fat. The whole is poured whilst hot into rawhide receptacles, two of which nearly form a load for a horse. It is eaten cold, cut into slices, or mixed with meal and boiled, forming a porridge called " rubbaboo." It is no

* *Gairdner's.* † *Swollen; from the dilated stem.*

doubt a very sustaining article of food and greatly relished, but personally I never cared much for it.

"The berries are gathered in immense quantities and dried in the sun and stored for winter use, forming an important addition to the stock of provisions which the natives annually lay by. The Ta-cully of the Upper Country usually prepare them by boiling in a bark vessel with heated stones; when reduced to a pulp they are formed into cakes and dried."—A. C. A. MS.

SALMON-BERRY.

Rubus spectabilis, Pursh.

The Chinooks call it "Yaniss." The young shoots of this plant, before they become woody, are peeled and eaten; they have a pleasant flavour and are gathered in large quantities in the spring. Dried salmon-roe is considered, among the knowing ones, the correct thing to eat with Yaniss.

THIMBLEBERRY.

Rubus nutkanus, Moc.

The young tender shoots of this plant are also eaten in the same manner as those of the Salmon-berry. It is one of the commonest of our Raspberries.

NOTE.—The various species of Raspberry, with the exception of the Salmon-berry, which is too watery, and the Creeping Raspberry, which is small and insignificant, are often dried in cakes and kept for winter use.

OSO-BERRY; BIRD-CHERRY.

Nuttallia cerasiformis, T. & G.

The fruit, resembling a Blue Plum, is borne in racemes. In size it is about ½ inch long; it has a large stone. It is of indifferent quality and seldom eaten.

WILD STRAWBERRY.

Fragaria spp.

The Wild Strawberry, of which there are several species in the Province, is ubiquitous and in some places produces heavily and is naturally a favourite fruit. One species which occurs on the high mountains bears white fruit.

HAWTHORN; BLACK HAW.

Cratægus brevispina, Dougl.; *C. columbiana,* Howell.

The fruit of the first is black or deep purple, and of the second red. The fruit is rather dry and sweet and is filled with enormous seeds as compared with the size of the berry.

OREGON CRAB-APPLE.

Pyrus rivularis, Dougl.; *Malus rivularis,* Roemer.

The fruit is generally boiled and, in the North, mixed with Oolhan-oil as a substitute for cream. In that form it is considered a great luxury by the native gourmands.

WESTERN CHOKE-CHERRY.

Prunus demissa, Nutt.

The fruit of this shrub is a favourite with the natives in those parts where it occurs. The fruit is both black and red. A favourite method of use is to allow it to be bruised in a saddle-bag and it is then eaten. It is also sometimes dried in the sun.

"The Cluster or Choke Cherry.

"This fruit, at first rather harsh and astringent to the palate, when properly matured is very sweet and agreeable. It, as well as the Service-berry, is frequently employed east of the Rockies as an adjunct to the finer kinds of pemmican. The Service-berry simply in its dried state, the Cherry first prepared by pounding between two stones. This process has the effect of bringing out the flavour of bitter almonds contained in the stones."—A. C. A. MS.

RED CHERRY.

Prunus emarginata, Dougl.

As already seen under descriptions of trees and shrubs, there are apparently two varieties of the Cherry, both attaining the dignity of trees, one intensely bitter and unfit for food; the other, which I have seen only at Nelson, an acid Cherry, quite edible, and useful for making into jelly and preserves.

WILD ROSE.

Rosa spp.

The various species of native Roses all produce fruit which when perfectly matured is quite palatable and nutritious, and, amongst other fruits, was used by the natives. The outer portion only is eaten, as the seed in the central portion is enclosed in bristly fibre quite unfit for food.

TALL RED WHORTLEBERRY; WINEBERRY.

Vaccinium parvifolium, Smith.

The fruit is preserved by some of the Northern Indians in Oolhan-oil and is considered to be a great luxury in that state. All the Bilberries or Huckleberries are used fresh, or dried in the sun like Currants or mashed and made into cakes.

CRANBERRY.

Vaccinium oxycoccus var. *intermedium,* Gray.

This is commonly eaten cooked in conjunction with other comestibles. This plant, ubiquitous in swamps all over the country, is too well known to need further description.

BEARBERRY; KINNIKINICK.

Arctostaphylos Uva-ursi, Spreng.

The berry is a beautiful red and is sometimes used, but on account of its dryness and large seeds is by no means a favourite. The flesh is quite mealy and sweet.

SALAL.

Gaultheria shallon, Pursh.

The fruit of this shrub is really good, with very small seeds, and is borne in large racemes. It is used by the natives in its fresh state and dried in cakes for winter use.

DWARF SALAL.

Gaultheria myrsinites, Hook.

The fruit, small, dark red, and well flavoured, is borne in racemes on the under-sides of the leaves quite near the ground.

BLACK CURRANT; WAXY CURRANT; RED-FLOWERING CURRANT.

Ribes bracteosum, Dougl.; *R. cereum,* Dougl.; *R. sanguineum,* Pursh.

The Waxy Currant is a poor, sickly-flavoured fruit. The Black Currant is found on the margins of streams and bears a large berry covered with a white bloom. In flavour and odour it resembles the cultivated Black Currant and makes a good substitute. The Red-flowering Currant bears an indifferent fruit, but quite palatable.

GOOSEBERRY.

Ribes divaricatum, Dougl.; *R. irriguum,* Dougl.; *R. Lobbii,* Gray.

The flowers of the last named are very showy and the fruit is as large as some of the cultivated varieties, but covered with a sticky, hairy skin which has to be taken off before using. Unlike the others, it is quite sweet and without any trace of acidity. The other two bear fruit about the size of a pea, quite black when ripe, and well flavoured.

SOAPBERRY.

Shepherdia canadensis, Nutt.

The Soapberry, or "Brue," as it is called by the French-Canadians, is the fruit of a shrub belonging to the Olive family. The fruit is about the size of a currant, but more elongated, and both red and orange in colour. It has the very peculiar character of being sweet, acid, and bitter as well as aromatic, and consequently disliked when first tasted, but generally liked after a closer acquaintance. It is called "Soapberry" from the fact that it forms a beautiful salmon-coloured froth when beaten up, and is generally so used. I have often seen the Indian women walking along the trails rubbing up the berries between wisps of grass and sucking the resultant froth. It is necessary in beating up this berry that the vessel be absolutely free from any trace of fat, or the froth will not appear. The juice, mixed with sugar and beaten with an egg-beater, is not unpalatable; the natives use bunches of twigs for the purpose. This plant occurs all over British Columbia and the adjoining States.

This fruit does not occur on the sea-coast to the north, and it is therefore an article of barter between the natives of that part of the Province and those of the Interior. For that purpose it is dried in the shape of large cakes, an inch or more thick. Sir Alexander Mackenzie refers to it as the "bitter berry" which he saw mixed with mashed fish-roe by the natives of the sea-coast.

BUFFALO-BERRY; SILVERBERRY.

Shepherdia argentea, Nutt.

This is the only other member of the foregoing family in this Province. The fruit is sometimes eaten. Being dry, with a large seed in the middle, it is not much good, though somewhat sweet. The shrub is unique in that it is silvery white throughout, the stems, leaves, and fruit being all of one colour.

HIGH BUSH-CRANBERRY.

Viburnum opulus, L., and *V. pauciflorum,* Raf.

It is an acid berry generally used cooked. "Mooseberry" is another name for this fruit. It makes a fine jelly and after the berries are touched by frost they are not very acid and are then quite palatable in their raw state.

RED-BARKED DOGWOOD.

Cornus pubescens, Nutt.

The white fruit is acid and bitter to the taste and unpleasant. It is eaten in its natural state.

PIGEONBERRY.

Cornus canadensis, L.

A shrub bearing a bunch of red berries, very beautiful but of indifferent quality as a food. It has a very wide range, being found in damp woods across the Continent to the Atlantic seaboard.

BARBERRY; OREGON GRAPE.

Berberis aquifolium, Pursh; *B. nervosa,* Pursh; *B. repens,* Lindl.

These three varieties are generally known as Oregon Grape. The fruit is blue in colour and intensely acid until touched by frost, when it is quite palatable. It makes a good jelly, but is not so used by the natives, who simply eat it in its natural state.

ELDERBERRY.

Sambucus racemosa, L.; *S. glauca,* Nutt.; *S. melanocarpa,* Gray.

The fruit of the first is scarlet, of the next blue with a white bloom, of the third a shiny black. The red variety is very beautiful but decidedly unpleasant. All three varieties are used by the natives boiled.

BEAKED HAZELNUT.

Corylus rostrata var. *californica,* A. DC.

The nuts are extensively used by the natives for food and are stored for winter use.

GARRY OAK.

Quercus Garryana, Hooker.

The acorns are used after being prepared in various ways, sometimes by roasting.

WESTERN YELLOW PINE.

Pinus ponderosa, Dougl.

The seed is shaken out of the cones when ripe and stored away. It is very pleasant to the taste, resembling the pine-nuts of the Sugar-pine. It is often crushed in mortars and made into a kind of bread in conjunction with the seed of the Low Sunflower.

WESTERN LARCH; TAMARACK.

Larix occidentalis, Nuttall.

An exudation of this tree, caused by burning, is a mucilaginous gum resembling gum arabic somewhat, but of a darker colour, ranging from light amber to very dark. It is sweetish with rather a pleasant flavour. It is greatly sought after by the natives where the tree occurs, and in order to promote an abundant flow the trees are wounded and burnt at the base. The gum often comes off in quite large sheets and looks very attractive. It may be mentioned that the Larch also has the ordinary resinous gum common to all conifers.

"The Larch, which is a deciduous tree and at the same time shares the nature of the Pine, produces from the bark and wood adjacent a perfect resin, whilst from the inner portions of a wounded tree a mucilaginous gum exudes. This is collected by the natives and esteemed a 'bonne bouche.' It is also used as an application in the case of ulcerated sores."—A. C. A. MS.

Chewing-gum can scarcely be said to come under head of foods. Gum-chewing is a habit common among all the natives of North America, I believe. It certainly is on the Western side of the Continent and I am inclined to believe that the habit was acquired from the Indians by our American neighbours. The gum employed for the purpose is the exudation which appears in round globules on the surface of the bark of several conifers, hard, amber-coloured, and opaque. The selected article does not stick to the teeth when it is chewed, but after a time gets brittle and is then discarded.

BITTER-ROOT; SPETLUM; SAND-HILL ROSE.

*Lewisia rediviva,** Pursh.

This plant, belonging to the Portulaca family, has its habitat in the arid regions of the Interior in open plains. The thick leaves, some 2 inches in length and shaped like those of Portulaca, come up in bunches in the early spring and are followed later on, when the leaves die down, by the flower, which is a beautiful pink blossom resembling a rose. In places they appear in great profusion and present a lovely sight. The Bitter Root Valley (in Montana, I believe) is named after this plant. When the leaves appear, the women dig up the roots, which are thick and generally bifurcated, with the digging-sticks previously described, and after stripping off the skin throw them into a basket. They are then dried and kept for future use. They may be eaten in that state or boiled into a pinkish jelly. As its name indicates, it has a bitter taste, somewhat aromatic, and is, I believe, quite nutritious; personally, I never cared much for it, although it is generally much appreciated. It is well named *L. rediviva,* as it is most tenacious of life, and I have known herbarium specimens to show flowers developing months after having been pressed.

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* *Restored to life.*

LOW SUNFLOWER; BALSAM-ROOT.

*Balsamorrhiza sagittata,** Nutt., and *B. deltoidea,*† Nutt.

It was commonly called Tobacco-root by the whites from the similarity of its appearance to the Nigger Head Tobacco, which was the only kind traded by the Hudson's Bay Company. This root is also quite sweet when cooked in the manner described, and can be kept a long time. The young sprouts of this plant just as they appear above the ground are also used for food. They are peeled and eaten raw. One of the native names is "Smookashin." The seed is pounded into a meal and then made into a kind of bread which is highly nutritious. I have eaten the seed, which is quite palatable, but have never tasted the bread. *Balsamorrhiza sagittata* is the variety which occurs all over the Mainland Interior and extends into the adjoining States, possibly to California. *B. deltoidea* is the variety which occurs on the sea-coast; in the vicinity of Victoria it is common. The former is named from its arrow-shaped leaves, which have the characteristic grey-green of arid regions. The Coast variety is so named from the supposed resemblance of its leaves to the Greek letter delta. The leaves are larger and of a brighter green.

SPRING BEAUTY.

Claytonia lanceolata,‡ Pursh.

The so-called "wild potato" is the tuberous root of this beautiful Claytonia, which belongs to the Portulaca family. The tuber is quite small, sweet, and agreeable in flavour. It is boiled for use.

ARROW-HEAD.

Sagittaria latifolia,§ Willct.

Both the common and generic names have been given on account of the shape of the leaves. The corm of this water-plant is known amongst some of the natives as "Sawash Waptoo," signifying Indian potato; "Sawash" in the Chinook jargon being a corruption of the French word "Sauvage" and "Waptoo" the Chinook for potato. It is boiled for use and is not at all unpalatable. On the Columbia River I have frequently seen flocks of swans, with their heads under the water and their tails in the air, feeding on the "Waptoo." Needless to say, a sentinel is always on the look-out during these operations. The Chinese use the identical bulb or one very similar to it for food, and it is to be seen in the market at all times in the Chinese quarters.

FIREWEED; WILLOW-HERB.

Epilobium angustifolium,‖ L.

The stalks are split open and the contents scraped out with a knife and eaten. It is sweetish and somewhat glutinous. This plant is ubiquitous, always coming up over burned areas; hence the name, Fireweed.

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* *Arrow-like.* † *Delta-like.* ‡ *Lance-shaped; referring to the stem-leaves.*
§ *Broad-leaved.* ‖ *Narrow-leaved.*

MOUNTAIN SORREL.

*Oxyria digyna,** L.

It is eaten raw or boiled and forms an excellent substitute for rhubarb. During some of my journeys in company with the late Dr. Fletcher, of lamented memory, we gathered and cooked it with sugar and very palatable we found it. The natural habitat of this plant is the rocky beds of mountain streams. Salmon and other fish roe crushed to a pulp and cooked, a favourite dish with the natives, is often flavoured with Sorrel.

CACTUS; PRICKLY PEAR.

Opuntia fragilis,† Haw.

The Cactus, called by the employees of the Hudson's Bay Company "Crapaud Vert," is sometimes eaten, generally in times of shortage of food. The thorns are burned off and the Cactus roasted in ashes. The natural habitat of this plant is an arid gravelly soil; hence it occurs in the Dry Belt of the Interior and on rocky points near Victoria and on some of the Gulf Islands.

WESTERN HEMLOCK.

Tsuga heterophylla, Sargent.

The inner bark of this tree is dried and used when other more palatable food is scarce amongst some of the Coast Indians. It is highly astringent.

Of the use of Hemlock-bark as an article of food the following is said by Sir Alexander Mackenzie in the account of his trip of exploration from Fort Chippewyan to the Pacific in 1793: "When we had satisfied ourselves with the fish, one of the people who had come with us from the last village approached with a kind of ladle in one hand containing oil and in the other something that resembled the inner rind of the cocoanut, but of a lighter colour; this he dipped in Oolhan-oil and, having eaten it, indicated by his gestures how palatable he thought it. He presented me with a small piece of it which I chose to taste in its dry state, though the oil was free from any unpleasant smell. A square cake of this was next produced, when a man took it to the water near the house and, having thoroughly soaked it, he returned, and after he had pulled it to pieces like oakum, put it into a well-made trough about 3 feet long, 9 inches wide, and 5 deep; he then plentifully sprinkled it with salmon-oil and manifested by his own example that we were to eat it. I just tasted it and found the oil perfectly sweet, without which the other ingredient would have been very insipid. The chief partook of it with great avidity, after it had received an additional quantity of oil. This dish is considered by these people as a great delicacy, and on examination I discovered it to consist of the inner rind of the Hemlock-tree taken off early in summer and put into a frame which shapes it into cakes of 15 inches long, 10 broad, and ½ inch thick, and in this form I suppose it may be preserved for a great length of time. This discovery satisfied me respecting the many Hemlock-trees which I had observed stripped of their bark."

Note by A. C. Anderson.—"These cakes are made of the inner sap of the Hemlock Fir. The practice is still common along the Coast. The addition of oil no doubt counteracts the astringent qualities I refer to."

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* *Twin; referring to the two-winged fruit.*

† *Fragile, easily broken; the leaf-like stems are brittle.*

Note on the Oolhan.

The Oolhan is a small fish, about the size of a smelt, which ascends the rivers in the spring-time, beginning, in the Columbia, in February, and ending, in some of the northern rivers, a couple of months later. It is exceedingly rich and delicate, and if it could be placed in a fresh state on the markets of Europe and the East would, without doubt, command a very high price. The scientific name is *Thaleichthys Pacificus*. Stories are told about the use they are put to as candles by the natives, but, as far as I know, this is purely mythical; I never saw anything but fire-light in Indian houses. Nevertheless, it may be perfectly true that the fish has occasionally been burned, but I believe only as a matter of experiment. The oil is extracted by the usual process employed, and also by placing the fish in open canoes, where they are allowed to decay, when the oil separates; after which it is placed in the square wooden boxes or buckets elsewhere described. As may be readily imagined, the oil extracted by the latter means is particularly objectionable, not only to the olefactory sense, but to the taste; nevertheless, it is highly relished by the natives and is eaten in various ways, such as mixing with fruit, etc. It used to be a common article of commerce between the Coast and the Interior Indians, the latter bringing furs and dried fruit to trade in exchange. A curious fact in connection with this fish on the Columbia River is that about the time the first steamers ascended that river the fish disappeared altogether for many years. Its disappearance was ascribed by the Indians to the commotion caused by the steamers. It now ascends the Columbia, however, in as great numbers as ever, in spite of the fact that there are many hundreds of steamers at the present time to one at the time of the disappearance of the Oolhan. The presence of steamers on the Fraser and other northern rivers has never had any perceptible effect.

The merits of this fish are peculiarly worthy of note, both for its delicacy of flavour and the unctuous richness of its flesh. It resorts in vast shoals to the Fraser River and others of the large streams along the Coast. Equal, if not superior, to the sardine of Europe, this fish must become eventually of great mercantile value. In the Nass River, falling into Observatory Inlet in latitude 55, immense numbers are caught by the natives in May. The oil extracted from them is a material object of barter between the people of the Coast and the tribes of the Interior for furs and other productions. The medicinal properties of this oil, which is of a viscid nature, almost resembling lard in appearance, are considered equal to those of the cod-liver oil and it is employed to the same end.

Note.—"The Oolhan used to be very abundant in the Columbia River, but it suddenly disappeared about the year 1835 from some unexplained cause and has never since returned to the river. It is mentioned by Franchere as the 'Poisson a la Brasse,' so called from its being, when dried, strung on cords and purchased by measure."—A. C. A. MS.

Note.—My father adds the letter "a" in spelling the name of this fish, making an additional syllable. As a matter of fact, the natives pronounce it in two syllables and I therefore spell the word Oolhan.

SCRUB PINE; LODGEPOLE PINE.

Pinus contorta, Dougl.; *P. Murrayana,* Balf.

The sap of this tree, which has an orange-like flavour, is widely used. In the spring, when the sap is rising, the bark is stripped from the younger trees by means of an implement made from the rib-bone of a deer, thinned and hollowed out at one end so as to fit the contour of the tree. The sap is taken off by an

upward motion. It comes off in long ribbon-like strips and is caught in a receptacle made from the bark. In its fresh state it is really most delicious. It is dried in the sun, the strips being placed side by side and crossed with another layer until the cake is of the required thickness.

ASPEN POPLAR; COTTONWOOD.

Populus tremuloides, Michx., and *P. trichocarpa,* T. & G.

The sap of these trees is collected and used in the same manner, but I do not consider it so palatable.

On the Gathering of Sap from Trees.

Extract from Sir Alexander Mackenzie's Journal, 1793, written at some point between the Fraser and the Coast: "Thus was our departure retarded until 7, when we proceeded on our journey accompanied by the man and his two sons. As I did not want the younger and should be obliged to feed him, I requested of his father to have lines for the purpose of fishing for the women. He replied that they were accustomed to fish for themselves and that I need not be apprehensive of their encroaching upon my provisions, as they were used to sustaining themselves in their journeys on herbs and the inner tegument of the bark of trees, for the stripping of which he had a thin piece of bone, then hanging at his side. The sap is of a glutinous quality, of a clammy sweet taste, and is generally considered by the more interior Indians as a delicacy rather than an article of common food."

HORSE-TAIL.

Equisetum spp.

The young tender shoots of this plant just as they appear above the ground are eaten in their natural state, the outer scales with which they are covered being first stripped off. It is composed principally of water and has no particular flavour, except a slight sweetish taste.

BRACKEN.

*Pteris aquilina,** L.

The roots of this plant, selected from rich shady situations where the growth is rank and the roots consequently large and succulent, are used for food by roasting over a fire. The outer skin is then stripped off and the interior pounded so as to separate the fibre from the edible part. Its range is all over the Province and adjoining States, attaining its greatest perfection to the westward of the Coast Range, where it sometimes grows to a height of from 10 to 15 feet.

SHIELD-FERN.

Aspidium munitum,† Kaulf.

One of the commonest of our Ferns. The rhizome of this plant, which is large and fleshy, is roasted and eaten. It is reported to be pleasant to the taste and nutritious.

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* *Pertaining to the eagle; "Pteris" means primarily a feather, hence "eagle-feather."*
† *Fortified; referring to its stiff sharply serrated leaflets.*

GREEN LAVER; PURPLE LAVER.

Ulva sp.; *Porphyra* sp.

This seaweed, which is to be seen on the rocks at low tide, is gathered and eaten fresh, or dried into compact cakes for keeping. It is a favourite dish with the Northern Indians, who use it boiled and mixed with Oolhan-oil. One of the natives names is "Thlakas." Large quantities are gathered by the Chinese for food.

BLACK LICHEN.

*Alectoria jubata.**

This is to be found hanging to the limbs of Pines or other conifers, generally in the higher altitudes. It is boiled for a long time into a jelly-like mass for use. It is said to be palatable and nutritious, but I have never tasted it.

Franchere, in the narrative of his journey from the Pacific across the Continent to Montreal in 1814, says that on arriving at a village of natives in the Okanagan he found them in a most deplorable state from famine. "C'est ce qui arrive souvent à ces pauvres gens, quand leur chasse n'a pas êté productive! Leur principale nourriture ne consistant alors qu'en *mousse de pin,* qu'ils font cuire et qu'ils réduisent à une espèce de colle, ou pâté noire assez épaisse pour prendre la forme de pain ou de biscuits. J'eus la curiosité de goûter de ce pain et je crus avoir mis dans ma bouche un morceau de savon. Cependant des gens qui avaient mangé de cette colle me dirent que lorsqu'elle est faite depuis peu, elle a un assez bon goût avec la viande."

("That is what often happens to these poor people, when their hunting expeditions have not been successful! Their principal food then consists only of pine-moss, which, by cooking, they reduce to a sort of gelatinous substance or black paste, thick enough to take the shape of bread or biscuits. I had the curiosity to taste some of this bread and I thought I had put a piece of soap in my mouth. However, people who had eaten this paste told me that it is quite good when cooked a while and taken with meat.")

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* *Crested.*

NATIVE MEDICINAL AND POISONOUS PLANTS.

The following are those plants which either have come under my notice through their reputation amongst the natives or are well known to have the qualities attributed to them. In the first instance, there is no doubt plenty of room to allow of considerable latitude in the supposed qualities with which they are credited; nevertheless, we may reasonably suppose that long experience has proved the efficacy of many of the simples used by the natives, and in some degree has justified the faith placed in the remedies and in those whose business it was to recommend their use. This latter, of course, goes a long way towards establishing belief in their healing properties. As regards poisonous plants, those having that property attributed to them by the natives have long been proved to bear the qualities they are credited with, and whilst their use was not frequently required or made available for unlawful practices, they were occasionally used for suicidal purposes.

In addition, there are many plants which may be classed as suspects and are often accused of causing the loss of live stock, and these I shall only refer to in a general way.

POISON; DEATH CAMAS.

*Zygadenus venenosus,** Wats.

This is the variety which grows about Victoria in company with the real Camas; it also occurs quite commonly in the open parts of the Province. *Z. elegans* is a variety which occurs in the higher parts. Both have the same grass-like leaf as the ordinary edible Camas, but are to be distinguished by the colour of the flowers, the former being of a yellowish-white, whilst those of the edible Camas are blue. Nevertheless, care has to be exercised by the natives in digging up the bulbs of the edible Camas on account of the resemblance of the bulbs. This is a well-known poisonous plant both to human beings and animals, the poison being contained both in the leaves and bulbs. According to United States reports, in the State of Montana 3,030 sheep were poisoned in 1900, of which 21 per cent. died. Experiments in the United States show the poison to be an alkaloid related to the violent poison of hellebore. One-fiftieth of a grain killed a frog in two minutes. The dose of strychnine fatal to a frog is twice that amount. From this some idea of the intensely poisonous nature of the bulbs may be gathered.

FALSE SOLOMON'S SEAL.

Smilacina racemosa, Desf.

The thicky fleshy root-stalk is grated and made into a poultice. According to my father, this was called by the French-Canadians "Les Ecronelles" or "Resinée."

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* *Poisonous.*

FALSE HELLEBORE.

*Veratrum viride,** Ait.

This plant, belonging to the Lily family, is found near watercourses, and is abundant on high mountain-slopes where the moisture is sufficient. It is a stout simple-stemmed perennial, 2 to 7 feet high, with a fleshy root 1 to 3 inches long, large stemless leaves varying in size, and a large loose terminal cluster of yellowish-green flowers. The poisonous character of this plant is well known to the natives, who, however, use the root in small doses as a medicine taken internally.

Instances have been related to me of accidental poisoning of dogs through overdoses given as a medicine. This is one of the poisons said to be employed by the natives for suicidal purposes. In the old gold-excitement days, when the rush of miners to the Cariboo goldfields was at its height, horses were chiefly employed packing in supplies to the mines, and, as may be supposed, food being scarce, the animals in an exhausted condition were glad to satisfy hunger with anything green; many were lost in consequence through eating this plant. Hence the plant came to be known as "Horse-poison" amongst the packers. Curiously enough, it does not seem to affect Elk or Wapiti, as I have seen large areas eaten off by these animals. The fact has been verified by others. Sheep are also immune. The seeds are said to be poisonous to fowls.

"A report on the effects of the poison states that it operates chiefly against the action of the heart and spinal cord, both of which it tends to paralyse. It has also a violent although somewhat tardy emetic and cathartic effect, a property which is often effective in expelling the poison from the system before it accomplishes its deadly work." (V. K. Chesnut, Asst. Botanist, U.S.A.)

COWBANE OR WATER-HEMLOCK, WATER-PARSNIP, AND POISON-HEMLOCK.

Cicuta occidentalis, Greene; *C. Douglasii,* C. & R.; *Sium cicutæfolium,*† Schrank; and *Conium maculatum,*‡ L.

All are closely related to each other and belong to the Umbelliferæ. They are found in water and on the margins of swamps throughout the Province and are grouped together here as "water-hemlocks." The roots of all are equally poisonous. *Conium maculatum* is an introduced plant, large quantities of which are to be seen in the old Douglas grounds at Victoria. The root of this is also very poisonous at certain seasons of the year. Cases of poisoning are reported in the United States from eating the roots of the Water-hemlock in mistake for those of another Umbelliferous plant, *Ligusticum scoticum.* Many cases of animal-poisoning have been reported to me at various times which almost invariably on investigation proved to have been caused by Water-hemlock. These cases of poisoning invariably occur in the early spring when cattle are in search of green food, a time when they are most likely to be ill-nourished. In plucking the green top they pull out the root from the soft mud, eat it also, and are poisoned. Cattle have even been known to be poisoned from drinking water

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* *Green.*

† *Hemlock-leaved; leaves resembling those of Cicuta or Water-hemlock.*

‡ *Spotted; from the red-spotted stems.*

Western Water-hemlock.

contaminated by the juice of roots which have been crushed by being trampled upon. The effect of the poison when large quantities are taken is so rapid that death results before remedial measures can be applied. This is another plant reported to have been employed by the natives for suicidal purposes. Like most of the members of the family to which the Water-hemlocks belong, it has a peculiar odour and taste due to the aromatic oily fluid which is found throughout the plant, especially in the roots and seeds. It is probably on account of this odour that the plants are usually compared with the Parsnip, which is the only

Oregon Water-hemlock.

commonly known fleshy-rooted member of the family possessing a similar odour. In the case of the Water-hemlocks, however, the odour is more decidedly musky and much more disagreeable. The Parsnip has one large fleshy tap-root and never becomes poisonous when growing without cultivation. The Water-hemlocks have a cluster of fleshy roots which are highly poisonous, the oily fluid in them containing a highly virulent substance which is probably the same in all the species.

Oregon Water-hemlock.

Purple-stemmed Water-hemlock.

FIREWEED; GREAT WILLOW-HERB.

*Epilobium angustifolium,** L.

This is a well-known plant throughout the Province, occurring most plentifully in burnt areas; hence its common vernacular name. It has a beautiful spike of rosy-pink flowers and grows from 4 to 6 feet high.

The root, or rather the running root-stock, grated and made into a poultice, is considered to be very healing. As a matter of fact, it was found to be so by my late father and was by him used and prescribed for wounds and sores. In one of his manuscripts he says: "L'herbe froide of the Canadian-French (*Epilobium angustifolium*), common in burnt woods and rich bottoms, is ornamental as a flower, and as a simple, useful. The roots are thoroughly dessicated and pounded, so as to separate the filaments from the mealy portions. A small portion of the latter mixed with water forms a tenacious mucilage very efficacious as an application for ulcerated sores. In conjunction with the roots of *Smilacina racemosa* (False Solomon's-seal) it is used in scrofulous cases."

WESTERN LARCH; TAMARACK.

Larix occidentalis, Nutt.

The natives purposely burn the trees in order to obtain the mucilaginous gum which comes off in amber-coloured sheets and is used not only for eating, but as an application for ulcerated sores.

COW-PARSNIP AND HOG-FENNEL.

Heracleum lanatum, Mich., and *Lomatium utriculatum,* Nutt.

These plants are common throughout the Province and both have the characteristic odour of Celery, Parsnip, and such plants. The roots are usually stout and woody and are used internally by chewing or ground up and mixed with water. One kind is known as "Chi-chee" amongst some of the natives and is considered a sovereign remedy for all internal disorders, headaches, etc.

HOG-FENNEL.

Lomatium nudicaule,† Coult. & Rose.

This plant, belonging to the Umbelliferæ, is a common one throughout the Province, and may even be seen in Beacon Hill Park, Victoria. The seed, which resembles that of the Parsnip, is borne abundantly and is gathered by the natives and ground up. It is, I am informed, taken internally for some complaints and also inhaled in the same manner as smelling-salts for headaches.

BUCKTHORN.

Rhamnus Purshiana, DC.

This is often called Barberry and is the well-known "Cascara sagrada" of medicine. The bark is used in a decoction as a purgative. It has to be used with discretion as the effects are violent and sometimes dangerous.

Swallowing water in large quantities so as to produce nausea is supposed to wash out of the stomach all irritant matter and is considered a sovereign remedy amongst some of the natives.

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* *Narrow-leaved.* † *Naked-stemmed; from the smoothness of the short stem.*

RATTLESNAKE PLANTAIN.

Goodyera Menziesii, Lindl.; *Peramium decipiens,** Piper.

A low-growing plant with beautiful mottled leaves and a spike of inconspicuous greenish-white flowers, belonging to the Orchid family. It is abundant in the fir woods in the vicinity of Victoria and general throughout many parts of the Province. On Queen Charlotte Islands there is a variety with longer leaves and not so beautifully mottled as the first named. The leaf, if crushed with a sidewise motion between the thumb and forefinger, divides, and is used as an application for cuts and bruises, the raw side of the leaf being laid next to the wound.

LOCO-WEED.

Oxytropis and *Astragalus* spp.

Loco-weed or Crazy-weed belongs to the Pea family and occurs in the open dry lands of the Interior Mainland or in the open parts of the Rocky and Selkirk Ranges. It is not definitely known which or how many species of the genera have peculiar injurious attributes. That many possess the poisonous matter which has caused grave losses to horse-traders in the Prairie regions, particularly in some of the adjoining States, and to a lesser degree in this Province, is beyond doubt, and we may therefore conclude that some of our varieties are poisonous. Possibly many amongst us have come across the term, as applied to a person, in stories of cowboys, etc., of being " plumb locoed," and many probably have no idea of the meaning of the term. It comes from the fact that the plant under review has the peculiarity, when animals, especially horses, acquire the habit of eating it, of rendering them crazy or insane. The loco habit once acquired by horses is like that of the opium habit amongst human beings, and unless they are quickly and permanently removed from localities where the plants are obtained they become so addicted to its use that they will eat nothing else, and gradually become so weakened that they are unable to move from one spot and eventually fall down and die. A United States report says: " The effect on a locoed horse is most peculiar, irregularities in gait and action like the drunken condition in men; affecting the eyesight, sometimes resulting in total blindness; errors in judgments as to size and distance of objects—for instance, making a huge leap over a twig or rut or ducking the head under a bar high in the air; all of which go to show that the disorder is of cerebral origin. These errors in judgment of ocular perceptions are a common occurrence, and are often so pronounced as to become ludicrous. Another peculiarity with locoed animals is frequently to mistake harmless objects for dangerous enemies. Cattle are seldom affected, sheep frequently, horses commonly."

A case once reported to me of cattle, driven over the ranges in the Chilcotin country late in the season, being affected in a similar manner seemed to indicate that it resulted from the effects of *Astragalus campestris,* specimens of which were sent to me for identification and which was the only, or principal, plant obtainable for food at the time of the year. A curious feature regarding the loco habit is that it is learned by imitation. From a United States report entitled " Stock Poisoning Plants of Montana " I quote: " In another part of the State an experienced sheep-raiser became nearly ruined financially through his sheep acquiring the loco habit. By adopting the method of immediately isolating the affected sheep, feeding them for mutton, and replacing them with sheep free from the loco habit, he has entirely eradicated this trouble on his ranch, although the

* *Deceptive; application unknown.*

Loco-weeds grow there as abundantly as ever." Horses apparently cured will often show vicious habits, fright, etc. A United States report says: "The present state of knowledge concerning the exact physiological effect of Loco-weed is so vague that no specific antidote or medicinal treatment can be recommended."

LUPINE.

Lupinus spp.

The Lupine belongs to the Leguminosæ, to which family it will be recalled the Loco-weed belongs. It is a plant of which we have many species, all usually considered as good fodder-plants. In Montana, however, some well-authenticated cases of poisoning of sheep fed with Lupine hay have been reported. In one instance a loss of 700 sheep occurred, in another 900, and several other similar heavy losses. Experiments show conclusively that Lupines are harmless during the earlier stages before the pods have been formed and during the later stages after the seeds have fallen out, all going to prove that the poison is contained in the seed.

BANEBERRY.

*Actea spicata** var. *arguta*,† Torr.

Belonging to the natural order Ranunculaceæ, this is a plant about 1 foot or 18 inches high, bearing a spike of white flowers; the fruit is a bunch of beautiful red berries, looking as if made of sealing-wax and which are said to be poisonous. *A. eburnea*,‡ Rydb., resembling the other in all respects except in the colour of the fruit, is found on the Mainland. *A. spicata* is fairly common throughout the Province.

BROAD-LEAVED LAUREL.

Kalmia polifolia,§ Wang.

A swamp-plant bearing a spray of beautiful rose-pink flowers is common throughout the Province. The leaves are poisonous to animals. A United States report says: "It is probably the most dangerous of all shrubs belonging to the Heath family. Many animals have been lost through eating this plant."

BARBERRY; OREGON GRAPE.

Berberis spp.

The quality of the three species are probably equal. My father says of it: "The root yields one of the best-known native yellow dyes, and a decoction of it forms an excellent detergent lotion."

POISON-OAK; POISON-IVY.

Rhus diversiloba, T. & G.; *R. toxicodendron*, L.

These plants are poisonous by contact, producing very irritating eruptions, and if remedies are not promptly applied are often distressing. There are some

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* *With spikes; from the spike-like raceme of flowers.*

† *Sharp-toothed; referring to the acute teeth of the leaflets.*

‡ *Ivory-white; from the smooth white berries.*

§ *Polium-leaved; white-leaved; from the white bloom on the under-side of the leaves, resembling that of the Polium, a species of Germander.*

curious features in connection with the effect of these plants which seem unaccountable; for instance, some people are immune from the effects of the poison. I have found myself unconsciously with a twig in my mouth, without suffering any ill effects, whilst I have known cases where violent poisoning has resulted from proximity to the plant. This has led to the belief that a volatile oil is exhaled from the leaves which affects persons who are not immune. This opinion seems to have been dispelled by experiments conducted by Dr. Franz Plaff, of Harvard University, who discovered that the poison is really a non-volatile oil. The oil, the report says, has since been purified and named toxicodendrol. It is found in all parts of the plant, even in the wood after long drying. The remedy recommended is alcohol with powdered sugar of lead added, which should be rubbed on the affected parts.

DOGBANE.

*Apocynum androsæmifolium,** L., and *A. cannabinum,*† L.

Both are common plants in the Province. A quantity of white milky juice is exuded when the plant is broken. This juice, when collected, forms a perfect india-rubber. It is reported to be poisonous to stock, but is rarely eaten as it is not enticing. A good fibre is made from the stalks by some of the natives.

ACONITE.

Aconitum columbianum, Nutt.

A handsome plant occurring in the high mountains of the Interior. It is poisonous to stock, but as it only occurs in high regions, little or no harm need be anticipated.

LARKSPUR.

Delphinium Menziesii, DC.

The Delphiniums, of which we have several in this Province, belong to the natural order Ranunculaceæ. *D. Menziesii* is the common one at Victoria. All share the general reputation of the poisonous qualities of their leaves, and whilst cases of cattle-poisoning have been frequently reported in the United States, I am not aware of any in this Province. As a matter of fact, the plant does not usually occur in such quantities in any one locality as to cause any trouble. United States Bulletin III., Part 1, says: "According to Wilcox, in Montana 600 sheep were poisoned by *D. Menziesii* on one ranch, of which 250 died."

MILKWEED.

Asclepias speciosa,‡ Torr.

Certain members of this family have been found to be injurious to sheep, but the experiments seem to be inconclusive regarding *A. speciosa,* which is the species occurring in the Dry Belt of this Province. In any case the plant is objectionable to stock and is therefore eaten sparingly, if at all.

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* *Androsæmum-leaved; from resemblance of leaves to those of Androsæmum, a species of St. John's Wort.* † *Hemp; the fibrous bark of the stalks was used by the Indians for making cords.* ‡ *Showy.*

BLACK NIGHTSHADE.

*Solanum nigrum,** L.

This is an introduced plant belonging to the Potato family. The fruit is reported to be poisonous as well as the plant itself, but since it is nauseous it is rarely ever eaten by stock.

BRACKEN.

Pteris aquilina, L.

Is reported to be poisonous to horses in England, but our experience in this country has not substantiated the statement. I have only seen it eaten in a dried state when cut young for bedding in stables. Probably any injury resulting would not be from any active poisonous principle, but from dust caused by the ripe spores.

HORSE-TAIL.

Equisetum spp.

It has been reported to me as poisonous to horses in the East, and similar reports have come from England. Experience in this country is not confirmatory of these reports; the Horse-tail, or, as it is called by the French-Canadians, "Prele," used to be considered excellent horse-feed, and when possible the Hudson's Bay Company's brigades were halted where it was abundant. "The plant, if deleterious, is evidently so only on account of its harsh scouring action in the mouth and intestinal tract," is the verdict of the U.S. Department of Agriculture.

ERGOT.

Claviceps purpurea,† Fr.

This is a parasitic fungus which affects the seed of many species of grasses and grains. That most commonly attacked in this Province is a tall rye-grass known as *Elymus condensatus,* which occurs in the alkali lands of the Interior. These affected heads are black in appearance, and the seed-stalks, being tall and stiff, stick out above the snow. It is at that time that it is most generally eaten by stock. The effect on horses seems to be fatigue and indisposition to work, resulting in a paralytic condition ending often in death. On cows the usual effect is the production of abortion, and in some cases a gangrenous condition of extremities sets in, resulting in loss of hoofs, ears, and tail.

POISONOUS MUSHROOMS.

Amanita muscaria,‡ L.; *A. phalloides,* Fr.

Their poisonous nature is too well known to need much description. A case which was reported to me from near Kamloops of the loss of valuable horses from apparent poisoning resulted in my making a personal investigation on the range, and the only plant which seemed at all likely to have caused the loss was a Mushroom apparently of the poisonous variety, the symptoms resembling those produced by phallin. Inquiries led to the discovery that goats had been poisoned in Oregon from eating so-called Toadstools. Cows also have been poisoned by the same cause in the United States.

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* *Black; colour of the berries.* † *Purple.* ‡ *Pertaining to flies.*

OUR FORESTS AND THEIR PROTECTION.

(Contributed by the Forestry Branch of the Department of Lands, Victoria, B.C.)

A TREE.

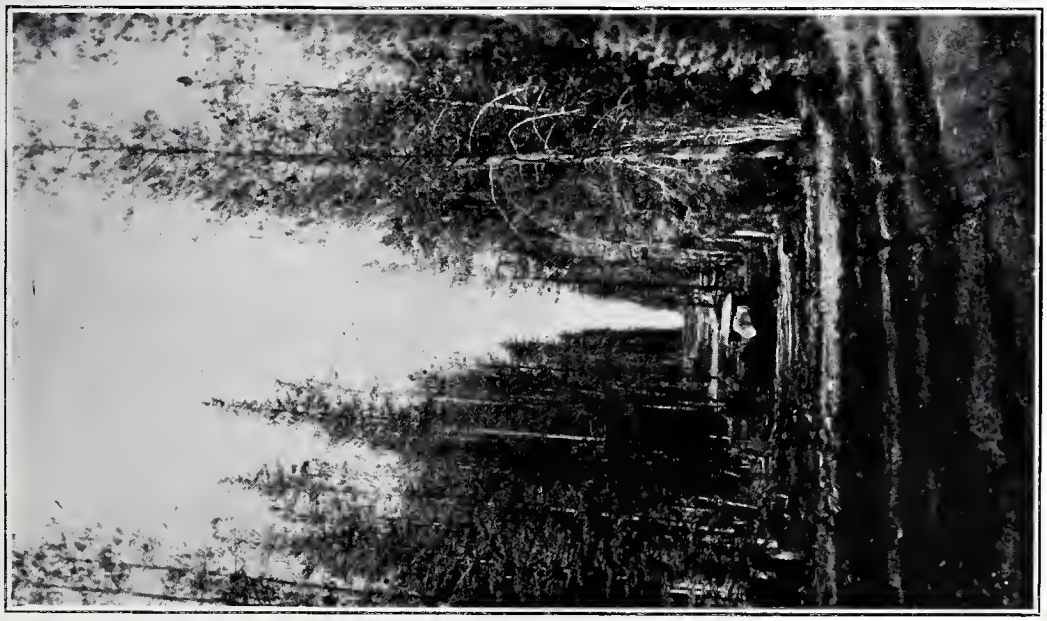
A tree may be described as the noblest example of plant-life. It may be more particularly described as a woody plant growing up from the ground usually with a single stem. Numerous branches are produced at both ends of this stem, those at the base penetrating the ground and forming an anchor for the tree, while those at the top form a crown in which develop leaves and flowers where they can secure air and sunlight required for their growth. The woody parts consist of a structure of hollow—often tube-like—cells, which vary in length and thickness according to the work which they have to perform. They also vary according to the species. The stems of trees grow in length throughout the youngest portions of the twigs, while in the roots the growth is confined to the ends. Growth in thickness, on the other hand, is brought about by a division of cells in the thin layer situated between the bark and the wood, known as the cambium layer. Those cells formed on the inside of the cambium layer produce the woody part of the stem, while those formed on the outside go to make up the bark. The young cells so produced, if properly nourished, grow to normal size, thus increasing the diameter of the stem. This growth takes place chiefly in spring and early summer, slowing down in late summer and fall, and stopping altogether with the approach of winter. This results in the formation each year of a thin layer of wood, and in cross-sections of the stem these layers appear in successive rings known as annual rings. In each of these rings the spring wood is rather light and soft, whereas the summer wood appears narrower, harder, and darker. After a few years the cells in the outer rings of the stem which form the sap-wood lose their living functions, become darker in colour, and go to form the heart-wood. This heart-wood strengthens and supports the tree.

A tree in developing from a seed passes through certain well-marked stages or periods. In the first or seedling stage the young plant assumes an upright form, developing root, stem, and leaves, which are the chief organs of nutrition. The second or brush-wood stage varies considerably according to the species, some in order to obtain sufficient light shooting rapidly upwards, whilst others occupy a longer period in obtaining a well-developed root system. The former are known as rapid-growing and the latter as slow-growing species. After the brush-wood comes the pole-wood stage, in which the difference in the rate of growth is not so marked, the maximum height, however, being attained somewhat earlier in the case of rapid-growing species. Then follows the young timber period, when part of the energy is expended in the production of seeds, with a corresponding slowing down in rate of growth until the maximum height is reached. This stage varies greatly; those trees as a rule which grow most rapidly in the earlier stages reach their maximum height soonest, whilst the slow growers are more persistent and may finally overtake the more rapid-growing ones. Finally, there is the old timber stage, in which growth in height stops altogether, although growth in diameter may still continue.

FOOD OF A TREE.

The materials upon which a tree feeds and develops are derived from the soil and air. Large quantities of water are taken up from the soil by the root-

A woodland road near Alberni, V.I. Photo. F. T. Shutt.



Through the woods from Quesnel to Fort George.
Photo. J. W. Gibson.

hairs. This water contains small quantities of mineral matter in solution. Older roots take little or no part in the absorption of water from the soil, their main function being to anchor the plant in the ground. The water containing the mineral salts is carried through the sap-wood of root and stem upwards to the leaves. Here surplus water is eliminated as water-vapour—a process known as transpiration.

The leaves take up carbon dioxide from the air. This is combined in the cells with hydrogen and oxygen taken from the soil-water and carbohydrates such as sugar and starch are formed, the surplus oxygen being given off. This process, known as photosynthesis, is made possible by the action of sunlight upon a green substance called chlorophyll found in the leaves of plants. The tree's food thus built up in the leaves is distributed to all of its parts, and is then further changed by the action of certain ferments into harder woody tissue.

Plants, like animals, take in oxygen and give out carbon dioxide in respiration. This must not be confused with the food-making process above mentioned, where quite the reverse is true, the leaves taking in carbon dioxide and giving off oxygen. The two are distinct vital processes, the former going on night and day, while the latter occurs only in sunlight.

All functions must be perfectly balanced. The development of the root system, for instance, which supplies the water and mineral salts, is not independent of the development of the foliage. Both are correlated and one must not overbalance the other or the tree becomes sickly and abnormal.

It must be kept in mind that the main function of the plant is the perpetuation of its species. Increase in size is merely incidental to its growth. In order to accomplish this each species has developed its own peculiar methods for the protection and dissemination of seeds. Reforestation is intimately associated with this important plant problem.

THE FOREST.

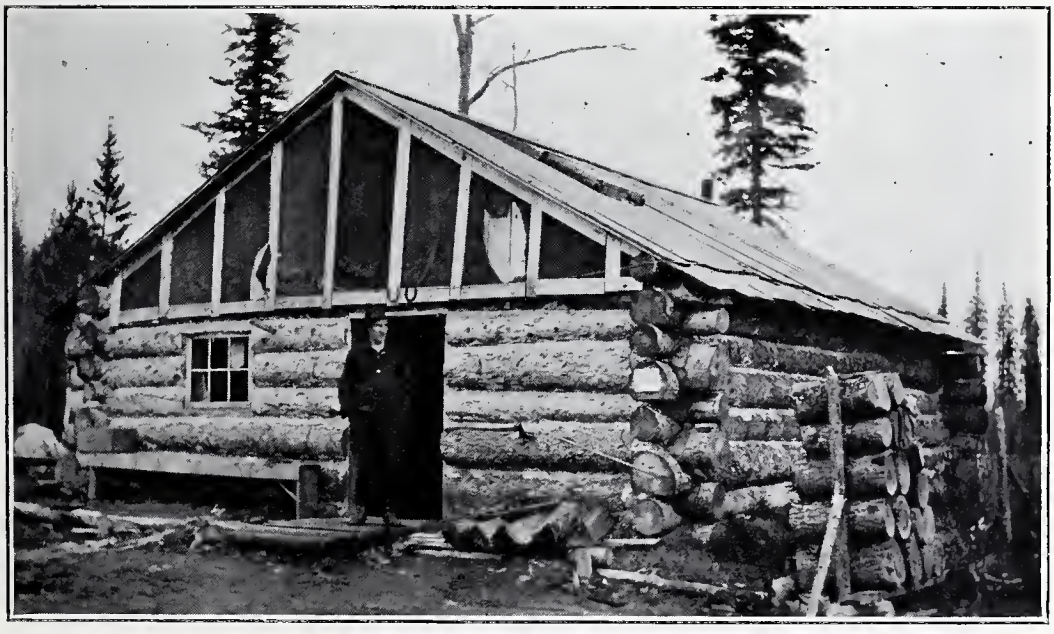
A forest in common usage is a tract of land covered more or less densely with trees. To the more careful observer, however, a forest is much more interesting; it is not a mere collection of trees, but a living community, organized on a definite plan, the result of evolution and the working-out of definite natural laws governing reproduction and growth. Each tree aids in the maintenance of the tree community, helps to protect its neighbour against wind which might overthrow it, and against the sun which tends to dry up the soil about the roots and to blister the tender bark on new shoots. The forest enriches the earth in which it stands and aids in regulating atmospheric conditions.

On the other hand, a constant struggle is going on between the individuals. Each year they push their crown-twigs and rootlets farther and farther afield. Sooner or later they meet those of their neighbours and then begins a struggle for the possession of space necessary for development and future growth of each —a struggle in which many fall before the giants of our mature forests reach their full development.

Climatic factors—temperature and moisture—determine in the first place the distribution of species. Different species are adapted to live within different ranges of temperature and humidity. We have yellow pine found only in the hot dry sections of the Province; cedar only in the moister parts. The absence of a tree in any forest, however, may not be due to its inability to grow under existing conditions, but rather to a lack of seed-distribution.

We have imported from many foreign countries trees that thrive in our climate, while our own Douglas fir and Sitka spruce have shown wonderful results when planted in England.

Forester's Look-out Tower on Mount Begbie.
Photo. Forestry Dept.



Forester's cabin, Tete Jaune Cache. Photo. J. W. Gibson.

Some species of trees are intolerant of shade; they must have direct sunlight for development and growth. Others can persist and even thrive in partial shade. "Tolerance" is a factor largely determining the ultimate character of the stand. A shade-enduring species may, through persistence in growth, eventually overtop its neighbour and so shut off the sunlight, with the inevitable result that the intolerant species must sicken and die. Or, even if not overtopped, the giant sooner or later becomes mature and, having lived his allotted span, falls, a victim of old age. Conditions on the ground under shade of this mature forest are not suitable for the development of seedlings of this intolerant tree, whereas the children of his shade-enduring neighbour thrive under such conditions and readily spring up and occupy the space vacated by the more exacting giant. So in the end, with nature alone controlling the destiny, it is the less exacting or more tolerant species which will win out in the struggle. The process, however, may take many centuries. For example, spruce will replace lodgepole pine in about 200 years, whereas in Douglas fir, hemlock, and cedar stands it will take from 1,000 to 2,000 years for nature to eliminate the Douglas fir. Sometimes it is a species wholly unsuitable for present-day use which wins in the struggle.

Again, the constant struggle, especially in the early years, determines the quality of the wood which we are to secure. As soon as the crowns begin to crowd, the lower branches, robbed of light, die and fall off. The height-growth is accelerated by the race to overtop the oppressing neighbour, resulting in those long, clear boles which give us the high-grade knot-free lumber. Trees grown in the open, on the other hand, where abundance of light reaches all sides, are short-boled. Large limbs reach almost to the ground and they are worthless for lumber.

The forester's aim is to produce the high-grade material needed in commerce, and he must plan his work to encourage the species of higher value and may even have to destroy the more persistent worthless species.

The tree which satisfies the arboriculturist is not at all suitable for the forester. In fact, single trees are not the object of the forester any more than single blades of grass are the object of the farmer. The forester aims to produce the largest amount of wood per acre in the most saleable or profitable form. He is interested in logs rather than trees, and the financial results from the harvesting of them. Not only does the forester deal with trees in masses, but with trees in natural conditions. He treats the forest as a permanent investment, always keeping in mind continuity and permanency for the future.

VALUE OF FORESTS.

Ever since prehistoric man caught up his first club to defend his life against his still more savage enemies the forest has had a value that cannot be measured in mere monetary terms. To him money was unknown, but life itself depended on that club.

Down through all the pages of history we find the same vital effect of forests upon the development of race and civilization. Countries once forested supported a vast and progressive people. With the depletion of their forest areas the country changed, progress slackened, and the people became decadent, or reverted again to nomadic life. Persia, Greece, and Spain offer examples. France, on the other hand, offers a reverse example. The reforestation of the so-called "Landes" converted a treeless, unhealthy, barren country into one capable of supporting a very considerable population.

Modern civilization is just as dependent on wood products. This has been called the age of steel, but it is more truly the wooden age. When we speak of

Giscome forest fire, May 18th, 1925.

wood the mind associates it with the house we live in, the furniture, the wood fire in the grate. The use of wood does not stop there. The varnish on the wall is dependent on a wood product. The gramophone records, now so widely used, are made from wood-flour. The morning news comes printed on paper made from wood. Perhaps we are wearing some fibre-silk clothing made from our spruce forests. The telephone message is carried on wooden poles and the train carries us smoothly along because it rides on wooden ties. Sweep away our forests and where would we turn to supply these every-day needs?

One can readily admit the use of substitutes. Substitution has been going on since our ancestors replaced the forest club with the stone axe, and yet we find that in such countries as England, even where they have to import and pay high freight rates on the major part of their requirements, the use of wood is increasing at a rate that will double the *per capita* consumption in fifty years.

In British Columbia 88 per cent. of the productive area is capable of producing timber, but not cultivated crops. We have already developed a great forest industry, the value output of which reaches an annual value of $75,000,000. In British Columbia one dollar in three in circulation comes from this source. One man out of every four finds employment in this industry. From $3,500,000 to $4,000,000 are returned to the Government through the sale of Crown timber each year, thus reducing the taxes by an average of $35 per taxpayer. The forest is the principal support for our railways; one car out of every two is loaded with forest products.

The 90,000,000 acres of land capable of supporting timber-crops would, under forest management, support a much larger industry in perpetuity. Can we then destroy our forests and still reach the greatness of development that this Province is capable of? Nor is this all. The tourist business is largely dependent on our green forest-clad hillsides. The fur and game are products of the forest. And even our agriculture is dependent on the forest-control of streams to prevent floods and the erosion of the steep mountain-sides and the accumulation of debris in the valleys. So even to this day our forests have a value to man greater than can be expressed in mere monetary terms.

ENEMIES OF THE FOREST AND PROTECTION.

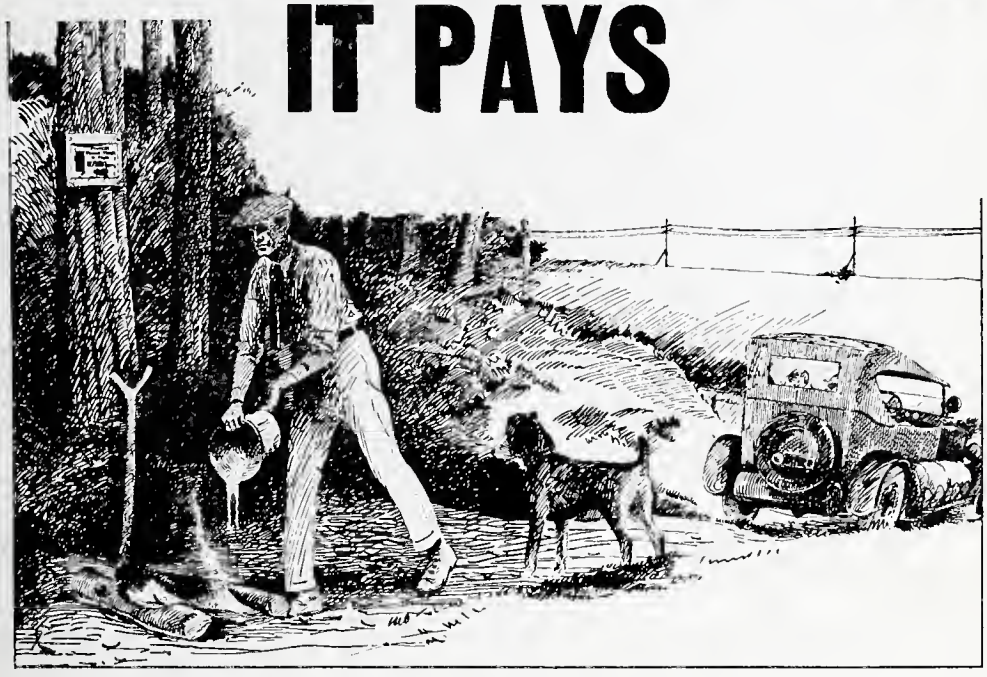
Life in the forest we have seen is a continuous struggle for supremacy. This struggle is not confined to trees themselves. Insects and fungi are ever ready to attack and make short work of any weakened species. Nature has maintained a balance on these forest enemies as shown by the magnificent stands of timber found when civilization first invaded the forest.

Insects, although always present in the forest, become destructive only when conditions are favourable for rapid multiplication. This largely depends on the food-supply. When extensive wind-throws occur or slash accumulates in large quantities the insects breed in multitudes in the half-dead wood, emerge in due season, and failing to find sufficient new slash attack the living, healthy trees.

Parasitic fungi and mistletoe, on the other hand, develop rather slowly and spread their activities over long periods. To control an outbreak of disease the fungi causing the damage must be completely eradicated, but in combating an insect-infestation it is usually only necessary to bring about conditions where the balance of nature is in favour of the natural enemies of the insects causing the epidemic.

Civilized man, however, has been the forests' greatest enemy and fire his instrument of greatest destruction. During the years 1919–23 there were in the forests of British Columbia 7,843 fires, of which 6,740 were caused by human

PREVENT FOREST FIRES
IT PAYS



A Tiny Camp Fire left aglow---
The kind you THOUGHT was out, you know---
May blaze anew a thousandfold;
Your fire's not out until it's cold!!

Report all fires to..... Forest Officer

Address ..... Phone .....

British Columbia Forest Service

agencies. In terms of percentage, 86 per cent. of the fires resulted from human contact with the forest and 14 per cent. from other causes. In order to justify the great educational campaign bearing upon forest-protection which has been and must continue to be waged, it is only necessary to elaborate a little further the above statement.

Campers and travellers, which include all those people who use the woods for their personal recreation, were responsible for 1,930, or 24.6 per cent., of the fires during those years. This one cause should teach a lesson that is not yet understood or appreciated. It means that almost a quarter of the fires which were started in the woods were caused by the very people who should have the greatest interest in protecting the woods. It means that parties that camped in a particular spot because the beauty of that particular place appealed to them cared not whether those that followed would enjoy the same natural beauties which had so appealed to them. It may not have been selfishness that was responsible for the destruction and blackened, fire-scarred waste that was left in their wake, but it certainly was gross and unpardonable carelessness.

It is a simple matter to make a camp-fire; to build it away from logs or trees; to scrape all debris, trash, needles, etc., to the centre, so as to expose the mineral soil for 3 feet all around and to quench it with water or bury it with earth when left for even a short period. If these simple precautions were followed the risk of forest fires starting from this cause would be negligible. If travellers would only remember that at certain times the humidity of the air is so low and the forest litter so dry that a spark from a carelessly thrown match, cigar, or cigarette is sufficient in time to cause a conflagration, endangering the lives and property of other citizens, then we would have fewer fires. The so-called "safe" fire is dangerous until it is completely extinguished. The smoker is dangerous in the woods so long as he does not deliberately extinguish his smoking materials.

During the same five years 828, or 10.5 per cent., of the forest fires were set by land-clearers. It is not out of place here to point out that this particular cause of forest fires is to be deplored the more when it is realized that the farmer of British Columbia is to a very large extent dependent upon the lumber industry in the Province in the selling of his products. The lumber industry, owing to the number of men employed in the logging, the sawmilling, and the manufacture of pulp and paper, is a very large consumer of farm produce. If the supplies of raw material, in the form of standing green timber, are destroyed, it is obvious that the lumber industry cannot continue, and therefore the farmer must lose this market. It goes further, however, since the farmer can, during the season when he is not needed on the farm, find employment in the timber industry at good wages and thereby add materially to his income.

The cause of many so-called settlers' fires is due to broadcast burning. This means leaving the debris scattered and setting the fire so it will travel over the whole area. A second, third, or even fourth fire is often required before the debris is destroyed. Such burning destroys the layers of humus or decaying vegetable matter so necessary for the upbuilding of a rich, productive soil. It is rich in soil-nitrogen and greatly facilitates the growth of bacteria. It also increases the water-holding power of soils, loosens them, and renders them more fertile and friable. It will be readily understood, therefore, that broadcast burning is harmful to the farmer and to the forester alike.

It would be cheaper in the end and more effective to pile the slash even if it required the erection of gin-poles and the use of block and tackle to pull the logs and debris into one centre. These poles can be burned when the ground is moist. Burning can then be done with safety and with little damage to the soil.

Prevent Forest Fires It Pays

Get the habit, nothing to it—
All the reg'lar fellows do it—
Break your match before you drop it,
Fire's our bugbear, help us stop it.

BRITISH COLUMBIA · FOREST SERVICE · LANDS DEPARTMENT

Among the other causes of forest fires are those which may be traced to the lumbering industry itself. The inherent risk in the business of lumbering is great and there are many potential causes of fires, such as ignition from engines, ash-pans, defective spark-arresters, brake-shoes throwing sparks in a down-grade, the friction of the heavy cables when drawn across each other or across dry logs, etc. When such fires do break out, however, there is usually a number of skilled and experienced men, consisting of the logging crew, at hand to extinguish them. In the case of the camper who leaves the fire to smoulder, there is no one by to check the spread of fire should it break out after he leaves.

Railways are also responsible for 15 per cent. of forest fires, but it is safe to assume that in this case also the careless individual plays a large part. How often does one see a traveller throw his still lighted cigarette out of the car window or off the platform of an observation-car, to fall among the dry litter of the right-of-way and so take its place among the fires of mysterious origin? All railway companies are required to have their engines inspected periodically for any possible defects in their fire-prevention appliances. The companies are most anxious that these be kept in good order, for the law states that railway companies shall be deemed responsible for all fires which start within 300 feet of the right-of-way, unless it can be proved that the company was not responsible. Modern railway-engines in their passage through timber burn fuel-oil to minimize the danger of fire from sparks, while patrolmen follow trains on speeders to catch fires while they are small and easily extinguished, so that it will be understood that every possible care is taken.

For years forest fires have been steadily eating into our timber areas, leaving the land, only too often, in such a condition that timber cannot grow upon it again for many decades—perhaps centuries. The land becomes what Mr. Gifford Pinchot, the late Chief Forester of the United States, described as "an area of loafing acres," by which he meant land that was not producing anything of economic value to the country.

In British Columbia there is no room for "loafing acres." We have a great area of land which is capable of producing timber, and timber alone, and to destroy not only the present crop, but the crop of the future, is a crime against generations yet to come.

If the history of forest fires is the history of man's carelessness, surely it is high time that such carelessness were stopped. It is a matter of education; a matter of constant reiteration of the need for care with fire in the woods, until the exercise of such care becomes habitual and is almost instinctive. A true conception of the value of our forests will do much to enforce that self-discipline on the part of every good citizen which will tend to make him mindful of the dangers of fire and zealous in the great cause of forest-protection.

FOREST DEPLETION AND THE REMEDY.

History gives us many a picture of the consequences of forest depletion. European countries and even the older-settled portions of North America are now feeling the first effects. In these districts the great timber industry has dwindled, and in spite of the fact that there are many "loafing acres" that could grow forest-crops, such countries are spending millions of dollars for freight on lumber that has to be shipped in. America is now largely dependent on the Pacific Coast for its future lumber-supply until the Eastern forests can be again built up to a state of productivity, and this will require one or two generations.

British Columbia contains one-half the timber-supply in Canada, 70 per cent. of the sawmill timber, and is the one large source of softwood within the British

Forest fire at Port Neville.

Empire. Out of an original stand of 1,000,000,000,000 feet, 650,000,000,000 has been lost through fire. The balance, 350,000,000,000 feet, is being cut into at the rate of 2,000,000,000 feet per year, and this rate is rapidly increasing. In spite of organized effort in forest-protection, fire losses are still heavy and will continue to be until the public in general swing solidly behind the slogan " Protect the Forest—it Pays." It requires 125 to 150 years to produce mature forests. Before that time has elapsed our present mature stands of timber will have disappeared. What then is the remedy? In a single word it is " Forestry," and the time to start in order to prevent disaster is " NOW."

LAWS AND REGULATIONS.

The Province of British Columbia has full control and ownership of its natural resources, with the exception of an area extending 20 miles on each side of the Canadian Pacific Railway and the Peace River Block, which are administered by the Dominion Government. The Provincial Statute, " An Act respecting Crown Timber and the Conservation and Preservation of the Forests," ordinarily known as the " Forest Act," being chapter 17 of the Statutes of 1923, is therefore our most important legislation in so far as forests and forest-protection is concerned.

The " Forest Act " is divided into twelve parts, as follows:—

Part I. provides for the organization of the Forest Branch, the appointment of officers. It lays down the principle that members of the staff are prohibited from dealing in the timber, and that an annual report of the work of the Branch shall be made to the Legislature.

Part II. deals with the prevention of trespass on Crown timber lands and provides penalties for unauthorized cutting. The trespasser acquires no right to or equity in the material wrongfully cut, which may be seized wherever found in the Province.

Part III. deals with the disposition of Crown timber by the Branch. The general principle laid down is " sales by public competition." It recites fees that must be paid, provides for the sale of wood for pulp-manufacture up to a thirty-year supply for the pulp-mill concerned, and makes provision for free-use permits for settlers and others.

Parts IV. and V. refer to the tenure of timber leases and timber licences and their renewal from time to time.

Part VI. provides for obtaining a right-of-way across Crown and private lands for the transport of forest products.

Part VII. deals with the reservation of royalties and lays down taxes to be paid on timber in specified cases.

Part VIII. provides that timber must be scaled by a licensed scaler before it is sawn and that proper returns must be made for all timber cut. British Columbia Log Rule is made the official rule. It provides for the licensing of scalers and supervision of the work west of the Cascades. All logs sold must be scaled by official scalers employed by the Branch, and the sale must be made on the basis of the official scale.

Part IX.—Unless exempted by the Chief Forester or District Forester, all timber cut must be stamped with a mark issued by the Forest Branch before it is floated or transported from the lands on which it is cut. The mark designates the area of land from which the trees were cut and the rates of royalty or tax to which the timber is subject.

Logging operations; "high-rigger" at work. Photo. Leonard Frank.

Part X. lays down the principle that timber must be manufactured within the Province, but gives the Lieutenant-Governor in Council power to allow export under certain conditions.

Part XI.—Forest-protection: Provides for protection of the forest and especially for fire-prevention. It creates the hazard period, May 1st to October 1st, a close season. During that period the following laws are important:—

Permits.—A written permit must be obtained for every clearing or industrial fire within one-half mile of forest or woodland and for every open burner. Apply to the local forest officer in your district when you need a permit.

Camp-fires.—All inflammable material must be cleared away for 3 feet in every direction from the edge of every camp-fire, and every such fire must be totally extinguished before the person making it leaves the place. Do not build your fire against a log or tree.

Smoking.—Lighted matches and burning tobacco, before being thrown away, must be thoroughly extinguished.

Brush and Slashings.—(1.) Persons causing any accumulation of inflammable debris within 300 feet of any public railway must dispose of the same under direction of a forest officer.

(2.) Persons clearing right-of-way for any purpose must dispose of all debris under direction of a forest officer.

(3.) The forest officer may require debris to be cleared away from around any camp, mine, open burner, or sawmill.

(4.) Dangerous accumulation of debris may be declared a public nuisance.

Fighting Fire.—Able-bodied citizens must help in fighting forest fires when called upon by a duly authorized fire-prevention officer.

Any person who neglects to do his utmost, or refuses to place at the disposal of the forest officer all his employees to extinguish a fire burning on land owned by him or on which he is working, or who resumes such operations without the written consent of an officer of the Department, is liable for all the expense incurred in fighting such fire, and every day's work shall constitute a separate offence against this Act.

Penalty for violation of the Provincial forest law, $25 to $300.

The Criminal Code of Canada also provides penalties as follows: "Up to fourteen years' imprisonment for wilfully setting fire to any forest or woodland; up to seven years for wilfully attempting to do so; up to two years for negligence and recklessness in setting fire or for violation of the Provincial fire law."

Part XII. deals with the general provisions of the forest law, collections of revenue, Court procedure, power to make regulations, etc.

Perhaps no better statement of the value of our forests as a great national asset and as the constant source of many of our daily necessities is to be found than that contained in an address by the late Dr. B. E. Fernow, Director of the School of Forestry of Toronto University, from which address the following quotation is made:—

"It may be stated without fear of contradiction that, outside of food products, no material is so universally used and is so indispensable in human economy as wood. Indeed, civilization is inconceivable without an abundance of timber. So general and far-reaching has its use become that a wood famine, however improbable its occurrence, would be almost as serious as a bread famine.

"Our civilization is built in wood. From the cradle to the coffin, in some shape or other, it surrounds us as a convenience or a necessity. There is hardly a utensil, a tool, or even a machine, in the construction of which wood has not

played a part, were it only to furnish the handle, or the mould or pattern. The articles, useful or ornamental, made wholly or in part of wood are innumerable. Our houses are filled with them; our daily occupations necessitate them wherever we are.

"The forest furnishes the cooperage to market our vintage; to store our flour and fruit. The forest furnishes the plough-handle and harrow-frame to cultivate; the threshing-machine and windmill to prepare the crops; the cart to bring them to market; the bottoms in which they cross the ocean to foreign marts, and even the tar and pitch needed to keep the cargo safe. We are rocked in wooden cradles; play with wooden toys; sit on wooden chairs and benches; eat from wooden tables; use wooden desks, chests, trunks; are entertained by music from wooden instruments; enlightened by information printed on wooden paper with black ink made from wood; and even eat our salads seasoned with vinegar made from wood.

"Consumption of wood is so enormously and constantly increasing that, in spite of substitutes, wood will remain a necessity. Natural supplies, however abundant, must give out unless we can and do reproduce as well as protect them. Forestry becomes the necessity of every country, and especially for those countries that have large supplies and are bound to be great timber-producers in the future."

VICTORIA, B.C.:
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1925.

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